

The Canadian Medical Association Journal

Vol. XX

TORONTO, FEBRUARY, 1929

No. 2

An Address

ON

SOME ASPECTS OF PREVENTIVE MEDICINE*

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MAY I at once express my deep appreciation of the high honour conferred upon me by the Winnipeg Medical Society in inviting me to deliver the Gordon Bell Memorial Lecture for 1928. I had the rare good fortune to know somewhat intimately the dear good man in whose memory this lecture was established. For a number of years I was his colleague on the Dominion Council of Health. Much more, however, I treasure our many, and for me inspiring, discussions of a wide range of subjects upon which Gordon Bell could speak with real authority. Never did he dogmatize nor become pedantic. Modesty, true culture, breadth of learning and a delightful sense of humour were his chief characteristics. He was a frequent and ever welcome guest in our laboratories, and his passing was a source of profound and abiding regret to my associates and to me. To very few is given the priceless gift possessed in such large measure by Gordon Bell of inspiring deep and lasting affection and respect. May his courage and splendid idealism be a continuing inspiration to the members of the medical profession throughout the length and breadth of this great Dominion!

It has been suggested that upon this occa-

sion I might choose as my text "Some Aspects of Preventive Medicine." I do so gladly. Preventive medicine in the sense in which it will be used in this address is the application of any or all the methods of medical science which will prolong life, promote health or prevent the occurrence of sickness. The methods of preventive medicine may be specific or general. Specific preventive medicine, or immunology, embraces the field of vaccination and passive immunization. General preventive medicine includes all those procedures which in the practice of obstetrics, pædiatrics, medicine, surgery or the specialties preserve or promote health. These may be distinguished from the therapeutic measures aimed at the cure of disease. Periodic health examinations, antenatal care, the practice of infant and child hygiene, advice in respect of diet, exercise, rest, clothing, etc., for healthy individuals, illustrate some of the procedures of general preventive medicine.

Sanitary science, or sanitation, includes all efforts directed towards the elimination of health hazards in the environment and the creation of favourable conditions therein. Such procedures as water purification, sewage disposal, supervision and control of food-stuffs, community cleanliness, individual and collective, serve as illustrations.

Public health activities include all those procedures carried out by a public health authority

* The "Gordon Bell Memorial Lecture," somewhat abridged, presented at a meeting of the Winnipeg Medical Society, November 30, 1928.

Published, by arrangement, simultaneously with the *Canadian Public Health Journal* (February), where it appears in full.

in an organized health unit, federal, provincial or local, such as public health bookkeeping (vital statistics); health education; public health nursing; conduct of isolation hospitals; organization and supervision of health clinics (usually in conjunction with the organized medical profession) in hospitals or elsewhere; school health service; control of water supplies and sewage disposal; the conservation of food-stuffs; administration of public health laws and regulations dealing with notification, isolation, quarantine, disinfection, etc., in cases of communicable diseases.

None of the above terms are mutually exclusive. All may be used to connote varied aspects of one undertaking under certain circumstances. Similarly, exact and precise boundaries do not separate preventive and curative medicine.

In the evolution of preventive medicine the scope of the subject has been constantly extended. The practice of this branch is carried on by medical practitioners in the routine of general medical work, and by those employed in departments of public health; also by private practitioners who undertake certain tasks, (e.g., school health-service), upon a part-time basis, for local or central health authorities. As a part of the work of the health departments, measures designed to ameliorate unfavourable social conditions may be organized, supervised, co-ordinated or actually carried out by such departments. Similarly, community undertakings for the promotion of social welfare frequently are closely integrated with the work of the public health authority.

In this paper those aspects of the subject of preventive medicine in which the general practitioner has an important place will receive special consideration. In the book of Ecclesiasticus the prime objective of preventive medicine, *mens sana in corpore sano*, is set forth in these words, "There is no riches better than health of body; and there is no gladness above the joy of the heart." Let us then examine at the outset the ways in which preventive medicine has contributed to these ends. The eighteenth century will perhaps in the future come to be looked upon as the time at which preventive medicine was born, and certainly the work of Edward Jenner marks the beginning of specific preventive medicine, the science of im-

munology. Bacteriology, the companion subject of immunology, had its genesis at an earlier date. Fracastorius and Fallopius, in the sixteenth century, and Kircher in the seventeenth, had preached the doctrine that infection was due to the seeds of disease. However, it was not until the middle of the nineteenth century that any scientific proof of the germ origin of disease was obtained. Davaine in 1850 observed that a specific micro-organism was present in the blood of animals dying of anthrax, and in 1876 Robert Koch established the specific etiological relationship to anthrax of the minute bacilli seen by Davaine. Pasteur, in the early sixties of the last century, began to make those fundamental contributions which have immortalized his name. These, with the contributions of Koch, may be regarded as the bases upon which the science of bacteriology rests. Virchow was perhaps the first great pioneer in the sister science of cellular pathology. The contributions of these and other investigators have made possible the recognition and control of many of the scourges which in the past have devastated mankind.

Early advances in sanitation were marked by the passage in 1388 in England of the first Sanitary Act which provided for the removal of nuisances. In 1543 an order was promulgated providing for the separation and segregation of persons suffering from plague. About two hundred years later, Richard Mead recommended the introduction of quarantine, which had been applied after a fashion some centuries before in Italy. Following Mead, Heberden and Huxham investigated the infectious fevers and Haygarth introduced notification and isolation of these diseases, (Newman). Pringle in the army and Lind in the navy advanced the cause of hygiene and sanitation. Successive epidemics of cholera in the first half of the nineteenth century in England greatly stimulated interest in sanitary reform. The name of Edwin Chadwick is associated with the pioneer efforts in the field of sanitary surveys (1842) which led to the Public Health Act of 1848. The work of Sir John Simon, the author of "English Sanitary Institutions" and of William Budd, who in 1873 demonstrated that typhoid fever is a communicable disease and elucidated the modes of transmission of the disease, deserves extended consideration. John Snow, at a somewhat earlier date, 1849, demon-

strated that cholera is a water-borne disease. In 1854 in London during a cholera epidemic he is reported to have told the vestrymen of St. James that the epidemic would subside if the handle of the Broad Street pump was removed. This was done and there were no further cases of cholera in that community. Budd is now regarded as one of the founders of the modern science of epidemiology. Experimental hygiene received its initial impetus when the first hygienic institute in the world was opened in Munich in 1875 under the direction of Max von Pettenkofer who contributed also to our knowledge of biochemistry and metabolism.

In the field of medical and vital statistics two very remarkable men, John Graunt, (1662) in his famous "Bills of Mortality" and William Farr (1839-1880) in his collected studies in "Vital Statistics" (1885), outlined the principles and indicated the methods upon which modern public health bookkeeping is based. In two other branches of preventive medicine most substantial advances were made—tropical medicine and mental hygiene. In the former, Laveran, in 1880, by his discovery of the causative agent of malaria, and Sir Ronald Ross, in 1897, in establishing the mode of transmission of the disease made possible the elaboration of procedures for its control. In 1901 the Commission on Yellow Fever of the Medical Corps of the United States Army, consisting of Reed, Carroll, Lazear and Agramonte, by heroic and self-sacrificing experiments, elucidated the fact that yellow fever is also an insect-borne disease. Other outstanding contributors in this field are: Sir Patrick Manson, who in 1879 first proved that insects serve as the vectors of parasites which cause human disease; Sir David Bruce, Leishman and Fritz Schaudinn, who also discovered the spirochæte of syphilis. These are but a few of the contributors to medical science whose work has made life in the tropics possible for the white man.

Psychiatry and mental hygiene were first advanced by the great French alienists and humanitarians Pinel (1801) and Reil (1803). John Connolly (1856), the Tukes and Griesinger, were also powerful advocates of non-restraint and humane treatment of the mentally afflicted. With the rise of modern psychiatry in Germany and elsewhere during the past

forty years there has been, notably in the United States and Canada, a rapidly growing interest in the problems of mental abnormality and subnormality. This has crystallized in the development of psychiatric clinics, provision for mental hygiene in schools, and the inauguration of auxiliary classes for the mentally subnormal.

Preventive medicine, or public health, of which the former is a part, is usually described as having passed through stages of which three at least are discernible. The first, beginning in Roman times in the provision of community water supplies, was aimed at the control of unfavourable environmental conditions. For three or four hundred years in the British Isles as well as elsewhere, interest was centred on this aspect of the subject. Specific preventive medicine was only born about one hundred and thirty years ago. It had but little application before the rise of bacteriology.

In 1875 in England the first great public health act was passed and organized public health work began to move forward with greatly increased momentum. Soon the second stage of development was entered upon. The study of the etiology of communicable diseases, the sources of infection in these, their modes of transmission and methods of control, both general and specific, was vigorously prosecuted. The third stage in the development of this movement has logically grown out of the second. Extended and careful study of the whole problem of mortality and morbidity and related social problems has clearly shown how broad is the field of public health.

Every factor which influences, or may influence, the health and well-being of the individual from the beginning until the end of life is of profound interest and concern to the public health authority and to the practitioner of preventive medicine. Until advance had been made in fundamental knowledge of biology, physics, chemistry, physiology, biochemistry, bacteriology, immunology, pharmacology and clinical medicine (including surgery and obstetrics) the methods employed were often inadequate, and the results were disappointing. Laws creating public health departments had not been passed and, in consequence, effective administrative procedures in public health were almost entirely lacking.

Medical education and the regulation of medical practice have advanced in a remarkable fashion and this advance has had very beneficial effects. One has but to read the medical history of the past hundred years to realize why public health in general and preventive medicine in particular had not, until about fifty years ago, brought clearly into focus their real problems and in consequence had not developed methods for their solution.

The passage of the Public Health Act of 1875 in England inaugurated a new era in organized public health work and represented the first stage already referred to. Much more rational and effective plans for the achievement of the broad purposes set out in the above enactment became possible, representing, as Sir George Newman said, "the most enlightened thought of the time (1871) regarding the sphere and scope of preventive medicine." These purposes were: (1) The supply of wholesome and sufficient water for drinking and washing. (2) The prevention of the pollution of water. (3) The provision of sewerage and utilization of sewage. (4) The regulation of streets, highways and new buildings. (5) The healthiness of dwellings. (6) The removal of nuisances and refuse and the consumption of smoke. (7) The inspection of food. (8) The suppression of causes of diseases and regulations in case of epidemics. (9) The provision for the burial of the dead without injury to the living. (10) The regulation of markets, etc., public lighting of towns. (11) The registration of death and sickness.

Soon advances in knowledge of the causation of transmissible diseases and the development of methods for their control made possible the transition to the second period in the evolution of public health. The necessity for notification of communicable diseases and the provision of isolation hospitals were especially emphasized in this era. Thus we arrive at the beginning of the present century. In the past twenty-five years, maternal, infant, and child hygiene have come to be a major feature of work in preventive medicine. School health services have been widely established and provision made for safeguarding the health of industrial workers. More intensive efforts have also been made to control certain communicable diseases, notably those of early childhood (diphtheria, scarlet fever, measles, etc.), as well as

tuberculosis and the venereal diseases, gonorrhoea and syphilis. Substantial progress in the development of mental hygiene has resulted from a clearer appreciation of the great possibilities in this field. Preventive obstetrics, preventive pædiatrics, and preventive dentistry have all made great strides during the past two decades. Nutrition and dietetics have come to occupy an important place in the field of personal hygiene. These are some of the outstanding characteristics of the third stage in the evolution of preventive medicine.

This period has been characterized also by a remarkable extension of popular health education, upon an unprecedented scale. This effort has received much impetus from the entry into the ranks of trained public health workers of the public health nurse. This addition to the personnel available for health educational work in the community has undoubtedly made possible more direct and effective efforts than had previously been put forth. The public health nurse, in the home, in the clinic, in the school, has brought to individuals and to groups the precepts of preventive medicine in its broadest aspects in a manner undreamed of a quarter of a century ago. Then, too, much more tangible and constructive social work in the prevention of poverty and destitution (as well as in the provision of relief) is possible through the close co-ordination of the activities of the public health nurse and the social worker.

Has all this effort brought any substantial prolongation of life, any reduction in the volume of sickness and death, or added materially to the joy of living, or increased the opportunities for useful service to one's fellows? To answer these questions requires access to the records of the volume and kind of mortality and morbidity over many decades and a clear appreciation of the limitations of such information. In Canada, the registration of births, deaths, and causes thereof is a recent development, at least in many parts of the country. Sickness records, except for quite incomplete returns of certain of the communicable diseases, are not available. Furthermore, population figures for the whole country for even the past fifty years are not entirely satisfactory. For these reasons, answers to the questions cannot be forthcoming based upon

Canadian experiences. What of other countries or communities?

In England and Wales the crude general death-rate for the decade 1871-1880 was 21 per 1,000 living; in 1924 it was 12; the infant mortality rate in the same period fell from 149 to 75 per 1,000 living births. Mortality due to typhoid fever has dropped from 37 per 10,000 of population to 1.2. In 1875 in England and Wales, 1,500 deaths from typhus fever were reported; in 1924 there were only five. In 1847 in the same country, the death-rate from tuberculosis of the respiratory system was 318 per 100,000 population; in 1926 it was 73. On the other hand there has been a steady increase in expectation of life. In the decade 1841-50 this was 34.6 years in males and 38.3 in females. In 1922 the expectation was 53.8 in males and 59.1 in females.

Similar advances have been made very generally throughout the civilized world. These figures answer in part the questions submitted. Obviously reduction in mortality and morbidity means for many people diminished sorrow and less suffering, but not necessarily increase in joy of living or opportunity for fuller and more useful lives. These are the social and economic aspects of the question which are difficult to analyze and really outside the scope of the present paper, even though of the highest importance and of great practical interest. Before considering in detail present problems and possible future developments of preventive medicine let us quickly review some further evidence bearing upon the results of the efforts of the past two or three decades.

In general it may be said that being an infant is much less hazardous than formerly. In 1871-75 for example, the mortality in England and Wales of infants up to one year was 153 per 1,000 births. In 1927 this had fallen to 70 per 1,000.*

A less satisfactory state of affairs, however, is revealed if we consider the still very serious risks of child-bearing. Everywhere cognizance is being taken of this fact and figures are

available* to show how essential is the need of careful inquiry and suitable action.

Between the ages of one and five years, mortality trends have also been downward and the same is true until the fifth decade of life is reached. In the higher age-periods, however, the trends are not such as to give rise to other than genuine concern. Some of the causes of death in the latter decades of life in which the trends are definitely upwards are shown in the following table:

ONTARIO—CANADA
MORTALITY RATES FOR CANCER, NEPHRITIS, AND
CIRCULATORY DISEASES FOR 5 OLDER

		AGE GROUPS				
		Five-year Average 1881-1885; 1921-1925				
		Rate per 100,000				
Year	Cause of Death	40-49	50-59	60-69	70-79	80+
1881-85	Cancer	36	81	128	200	210
1921-25		88	213	473	816	1000
1881-85	Nephritis	17	24	58	109	114
1921-25		34	69	177	403	740
1881-85	Circulatory Diseases	60	124	278	490	430
1921-25		89	256	823	2500	5730

Very brief consideration of the communicable diseases as factors in general mortality reveals certain facts of considerable interest. Those diseases for which methods of specific prevention and serum therapy (vaccination or active immunization) have been developed are being brought under control. The same is true of those diseases in which vigorous educational work has been combined with the provision of adequate diagnostic and treatment facilities, as in tuberculosis. Progress is also being made in dealing with syphilis because of earlier diagnosis and improvement in treatment, since it is specific and usually more prolonged. There too the value of popular health educational effort has been demonstrated.

Communicable diseases which are spread by water and foods are susceptible of almost complete control by the institution and maintenance of those elementary sanitary requirements

* Annual Report of the Chief Medical Officer of the Ministry of Health, England and Wales, for the year 1927.

* See "Protection of Motherhood" by Dame Janet Campbell, Reports on Medical Subjects No. 48, Ministry of Health, England and Wales, 1927.

of any community, pure water and clean food. Hence typhoid fever, dysentery, Asiatic cholera, etc., should never again be menacing problems in preventive medicine. Then, too, for these "enteric" infections there are specific methods of prevention.

Among all the communicable diseases, the situation is least satisfactory in respect of prevention and treatment in the group of acute respiratory infections. Influenza is still a baffling problem and may again sweep round the world in pandemic form with disastrous consequences. The pneumonias continue to take great toll of human lives. The so-called "common-cold" as a cause of temporary disability and consequent economic loss is most decidedly one of the unsolved problems in this field.

These problems in preventive medicine may be considered from several viewpoints when plans for their solution are under consideration. Some clearer conceptions will emerge if we consider them under subdivisions as:—

1. Those diseases or slight deviations from the normal in which the prime requisite is further research and investigation into causation, and, later, the development of suitable methods of prevention and treatment. Many conditions will fall into such a category. This is perhaps the first great need in the present or future advancement of preventive medicine. Research and still more research! Investigation at the bedside, in hospital or home, in the laboratories, in the clinic, indeed at all times and in all places where the well or sick come under medical observation! Well persons who desire to receive routine periodic health supervision may in future provide much clinical work for physicians. Furthermore, these "health clients" will probably furnish many difficult problems. The presumed healthy person, who is a "health client," is primarily interested in being maintained in a condition of vigorous bodily and mental health. In the achievement of this most laudable aim the physician, who is a practitioner of preventive as well as curative medicine, may assist. The value of the service which may here be rendered, however, will depend in large part upon the acquisition of further knowledge of the early signs and symptoms of disease. It is assumed of course that such additional knowledge, when gained, will

be possessed by physicians in general and, furthermore, will be utilized by them.

In this category of future preventable causes of death and disability may be included: cancer; the degenerative diseases of the heart, arteries and kidneys observed in persons in early middle life; the causes of death in the puerperium other than those due to sepsis, eclampsia, etc., the neonatal period (the first week of the first month of life); influenza and the large bulk of the pneumonias; and diseases of the nervous system. This list is of course quite incomplete, but is illustrative.

2. Other diseases where in the present state of knowledge almost complete prevention and control is possible, such as: smallpox, diphtheria, typhoid fever, scarlet fever, rabies, and perhaps some other transmissible diseases. In addition one might include those conditions which could be reduced in their incidence by appropriate measures, such for example, as the use of convalescent serum in the prevention of measles. More effective action against these diseases awaits a more general knowledge and understanding among the masses of the people of what is realizable in the field of prevention. Two other conditions it seems must also be met before any substantial improvement can take place. These are the creation of local health organizations everywhere throughout the country in rural and urban communities alike. These must be suitably staffed and there must be a close working relationship between such public health units and the medical, dental, nursing and veterinary professions, so that the nation's entire resources may be unified and co-ordinated in the struggle against preventable disease. That this is neither academic nor impracticable will be realized by everyone who considers what was accomplished during the Great War as a result of organization. It seems inconceivable that any great body of intelligent people will fail indefinitely to take cognizance of these facts.

Early in the period when cities, states, and provinces organized public health services, the necessity of making provision for the care of persons suffering from certain diseases was recognized. Hence "fever" or isolation hospitals and institutions for the care of the mentally abnormal and subnormal were established and maintained. At the outset certain

definite distinctions were made between patients received in the types of hospitals mentioned and those receiving treatment in general hospitals. The first distinction perhaps, or at any rate an outstanding one, was this: the patient in the fever hospital was recognized as a source of possible danger to others, and this was a stimulus and incentive for the practice of any and all measures of prevention. Then too the economic consequences of the occurrence of such cases were soon appreciated. Finally, the individual suffering from a communicable disease came really to occupy almost a preferred position in respect of the consideration shown him by the state in the provision of diagnostic and treatment facilities. All of this is regarded as reasonable. The question at once arises, however, since the measures so far introduced are justified, is it not desirable to take the next step and make arrangements so that health supervision will be made available for persons of all ages and of any economic or social condition? In other words, provide that curative and preventive medicine shall no longer be separated, in so far as the state takes cognizance of them; recognize rather that they are essentially two phases of one activity, both of which are necessary for the fullest realization of the objectives already set forth.

In order to develop this thesis at somewhat greater length it will perhaps be wise to recall for the moment the situation as it obtains in many communities in Canada at the present time. In a relatively small number of municipalities and, (with perhaps a dozen exceptions) only in larger urban centres, are there well-organized health departments with adequate appropriations and the necessary personnel. Elsewhere, very much remains to be accomplished before local health organization is completed. On the side of curative medicine there are hospitals, special and general, to the number of approximately 570 to 600 in Canada, with about 55,000 to 60,000 beds. There are believed to be about eight thousand physicians actively engaged in the practice of medicine. There are perhaps one thousand in addition in other fields, such as research, teaching, public health, hospital administration, direction of medical or lay organizations, etc.

We have a large volume of mortality, the extent of which is definitely known, its causes

in part understood and in part obscure; a great deal of sickness, the precise amount and kind not definitely known, although sickness surveys made in the United States indicate that about 2 per cent of wage-earners in any community are seriously ill at any given time. Some of this sickness is promptly and satisfactorily dealt with; much of it is probably unattended, or seen late, when valuable time has been lost. Thanks to the care with which sickness data are compiled under the National Insurance Act of England and Wales it is possible to obtain some further idea of the volume and kind of sickness observed among many millions of insured persons. This material is based upon the insurance medical records of panel practitioners.

In the year 1924, it is estimated that there were 13,600,000 persons in England entitled to treatment and attendance during illness. In that year between 45 and 50 per cent of the insured population received medical treatment. It was estimated that the time lost through sickness among this group in 1924 was approximately twenty-three and one-quarter million working weeks. Scrutiny of the records of 553 medical practitioners in four hundred areas, rural and urban, covering 903,000 insured persons on the lists of these practitioners, gives information as to the causes of sickness in the group. For the purpose of this illustration a representative sample of from 100 to 300 records with a diagnosis was taken. The total number of selected records was 92,135 and the cases of illness shown on them were 107,796.

It should be reiterated that this only indicates the general character of attended sickness among a proportion of the insured population in England in a given year. It gives no information regarding illness which was not attended among the above group of insured persons (the first three days of illness are not covered by sickness benefit), and may not reflect the condition of affairs among persons of all ages in the non-insured population. With this reservation, however, certain general conclusions may be drawn. One-third of these patients suffered from acute respiratory infections; nearly 15 per cent from rheumatism, lumbago, neuralgia, etc.; 12 per cent from indigestion; 10 per cent from injuries and 7 per cent from local infections, etc.

It may be fairly asked at this juncture whether the extension of interest of the or-

ganized community—the state—into the problem of non-communicable preventable disease, or indeed, of invalidity in general, would be in the best interest of the public. Obviously, if all sick persons are able to provide themselves with medical and dental treatment, nursing care in hospital or at home when such is needed, and, in addition, can afford to pay for health supervision which has come to be regarded as essential, then the problem would not be an economic one but solely a question of education. Unhappily such is not the case. Satisfactory provision for the necessary requirements in the way of medical and other related services, both preventive and curative, is for a large part of the population very difficult. Instances in which the occurrence of illness in a member of a family has been followed by disastrous economic consequences are known to all. For many the cost of absolutely essential obstetric and paediatric service is a major economic problem. Under such circumstances it does appear incongruous to advise additional health supervision to those who are already unable to obtain the necessary service in curative or preventive medicine, at their own expense. If this is true then certain inferences may fairly be drawn. The first is that persons who need such professional care fail to receive it, or do so only at a late date after much valuable time has been lost. If these persons have been victims of preventable illness, then avoidable economic loss has been incurred by the sick person and by the community at large. It pays to prevent sickness. This is a sound economic proposition, and one on which there is complete agreement among physicians, economists, and all who have given the question careful thought.

It is necessary to appreciate that much preventable sickness lies outside the scope of activities of departments of public health as presently organized. Furthermore, there is a well-founded opinion, which is quite widely held, that economic considerations do restrain many people who otherwise would gladly avail themselves of existing facilities for early diagnosis and treatment and for disease prevention.

It has frequently been stated that "well-to-do" persons in any community and those who are poverty-stricken or destitute receive the best and most satisfactory care when sick and

also such preventive services as can be provided at present. This may or may not be true. In any event it need not deter us in our endeavour to answer this simple question: Is the present system for the prevention of sickness and the provision of medical care in this country the best that can be devised? If not, the first essential is an inquiry into the facts of the situation. Such an investigation might be undertaken by a group representing the organized medical profession, the federal and provincial departments of health, and, perhaps, representatives of other interested bodies. The Committee on the Cost of Medical Care recently (1927) set out to explore this field in the United States, illustrates how some of these questions might be approached by a suitable committee. The investigation of Canadian conditions should be made by Canadians. The remedies which might be proposed should be designed primarily to meet our own needs.

Many authorities insist that in actual practice there is no sharp line of distinction between preventive and curative medicine, the practice of both being the function of the physician alive to his opportunities. The scope of work in preventive medicine will expand with a wider appreciation on the part of the general public of the value of health supervision. Furthermore, better service will be rendered by the physician when much more is known of the early symptoms of disease. At the outset there must be very slight deviations from normal function. Important light may be shed upon the nature of such abnormalities by repeated careful examination of presumed healthy persons, when both clinical and laboratory methods are utilized. The removal of every deterrent which causes persons to hesitate to consult a physician upon the first appearance of any symptom should certainly be undertaken. Methods to overcome economic obstacles in the provision of medical, nursing and hospital care have been adopted in many countries. In general, these are of two sorts, voluntary and compulsory sickness insurance. Voluntary insurance against sickness is a wise precaution which is taken by many persons in Canada and the United States at the present time. Such voluntary insurance may simply be a contract between any individual and an insurance company. There is, in addition, in these

countries a very limited form of sickness insurance which certain fraternal benefit societies provide for their members. This is an arrangement effected by groups or individuals. Then, again, in certain industries some provision for medical service for employees is made. This is often a joint undertaking on the part of employers and employees, and is voluntary in the sense that no one is compelled to enter a particular industry where such a plan of sick insurance is in operation.

In Europe, voluntary insurance institutions exist in a number of countries and the system introduced into Denmark in 1892 has been followed in Belgium, France, Finland, Italy, Netherlands, etc. The Danish system of social insurance against sickness is carried on through and by institutions which existed in the country at the time of its introduction, namely, mutual benefit societies, public relief institutions, and charitable societies. The laws dealing with sickness insurance are based upon three principles: voluntary, for all persons without means; subsidy from the public authorities; supervision of institutions by state departments. Legal provision is made in Denmark for the organization of sickness fund associations for particular industries or for particular districts. Only persons of the wage-earning classes without means, or men and women on that economic level, small farmers, handicraft workers, etc., are eligible for membership in the funds. A definite limit of income or capital is set which varies with the cost of living. Only persons within the prescribed economic limit are eligible for membership. In 1925, medical attendance was provided at a cost of 14,559,888 Danish crowns, or over \$4,000,000. Further details of the Danish and other similar national systems of voluntary sickness insurance will be found in "Studies and Reports," series M (Social Insurance) No. 7—Voluntary Sickness Insurance, International Labour Office, 1927.

In the general introduction to the study of compulsory sickness insurance made for the International Labour Office of the League of Nations, and published in 1927, this statement appears:—

"In spite of its valuable achievements, the voluntary insurance movement has been found insufficient,

and it has become clear that the way to secure general and effective protection against the risk is by making insurance compulsory. The modern state, as guardian of public health and national prosperity, considers it both a right and a duty to impose compulsion. Even the devotees of individualism admit that in a well organized community a person should not be free to indulge in improvidence which leads to his becoming a charge on the rates, and that insurance is a social duty, the performance of which the State may, in the general interest, enforce."

It is not intended at this time to set out in detail the various reasons which have led to the introduction of sickness insurance in many countries. It is of special interest, however, to learn that a number of authorities on the subject of social insurance believe that sickness and invalidity insurance should have as their primary function the advancement of preventive medicine.

Sir George Newman, Chief Medical Officer of the Ministry of Health of England and Wales, in his annual report 'On the State of the Public Health' for the year 1925, dealing with the insurance medical service wrote as follows:—

"The insurance (medical) practitioner, however, although he fulfils functions of great public importance, is a private medical practitioner who, in virtue of an agreement he has entered into with the local insurance committee, has undertaken to give, in accordance with the conditions of the service, medical attendance and treatment to those insured persons who, in the exercise of their free choice of doctor, elect to avail themselves of his professional services. The service, broadly, is conducted as private medical practice is conducted. The insurance practitioner sees his insured patients in the same consulting room as that in which he sees his private patients. As a general practitioner he brings to bear upon their various ailments the same skill and the same methods of diagnosis and treatment that he devotes to his private patients. In short, the aim of the insurance system is to utilize the private practitioner, not to abolish him or replace him by a public official.

"In the insurance medical service, then, we have created a system which, for the first time in our history, has brought the work of a great body of private practitioners into organic relation to our public organization of preventive medicine. The importance of this step is unquestioned, but its full significance is far from being fully realised. There is still a tendency to regard preventive medicine as something entirely built up and maintained by the work of public officers. That public officers have played a great and splendid part in the development of British preventive medicine is, of course, a fact of which all those who are now labouring in the service of the central and local health authorities may be justly proud. But it must not be forgotten that in this great movement the private practitioner has high claims for recognition. The clinical foundations upon which the superstructure of preventive medicine rests were laid in this country in the eighteenth century by medical practitioners who derived their inspiration from that trinity of practitioners which constitutes the chief glory of British medicine, William Harvey, Thomas Sydenham and John Hunter.

"In three respects the insurance practitioner is placed in a position of special advantage in the attack on disease: first, he encounters disease in its beginnings;

secondly, he sees his patients in their own homes; and thirdly, his relation to them is not embarrassed by considerations of gain.

"These three characteristics of his work are closely related; the first and second, indeed, exist largely because of the third. He sees his patients at the outset of illness, chiefly because no question of fee is interposed between him and them. His patients seek his services early because they have no fear of the doctor's bill before their eyes. Similarly, he can continue his attendance for the full period for which he is needed, without any thought that his assiduity might be misinterpreted and attributed to his desire to run up a long account. And the absence of the cash nexus between doctor and patient in insurance practice is not counterbalanced by the introduction of the element of 'charity.' The insurance doctor receives no fee from his patients, but, nevertheless, he is paid. The patient is not deterred from sending for his doctor by the feeling that he will receive something for nothing. He has paid his insurance premium in the form of weekly contributions, and his doctor is receiving, for his attendance upon him, what an impartial tribunal has held to be adequate payment.

"The insured patient, then, undeterred by considerations of cash or 'relief' sees his doctor early, and the doctor is in a position to observe the early signs of disease and to attack it at the stage when it is most vulnerable. This in itself is an enormous advantage. But there is the further advantage that the insurance doctor sees what the hospital doctor does not see, or relatively seldom sees, the patient's home and its surroundings. Here is a wide field for the observing and painstaking biologist, for the doctor by the nature of his calling is essentially a biologist. Thus, the insurance practitioner is in a unique position of advantage to study and deal effectively with the problems of disease that press for solution. Is he making the most of his opportunities? It is too soon to give a definite answer to that question. The service is young. It must have time to make manifest the good that is in it.

"The number of insured persons entitled to medical benefit under the National Health Insurance Act in the year 1925 was, approximately, in England 12,861,000, and in Wales 834,000, making a total of 13,695,000. The population of England and Wales in 1925 was 33,890,000. The number of persons entitled to medical benefit was, therefore, equivalent to rather more than one-third of the total population; and in considering the national importance of the service it must be remembered that these insured persons, both men and women, were bread-winners, on whose health, and consequent capacity for earning, the living of the great majority of the remainder was dependent.

"The number of insurance practitioners in 1925 was in England 12,920 and in Wales, 907, total 13,937 (of a total of about 26,000 general practitioners). The average number of insured persons on a doctor's list was 957. The total cost of medical benefit in 1925 in England and Wales was £8, 280,300 (\$40,242,258) of which approximately £6, 411,138 (\$31,158,131) was devoted to the remuneration of doctors and £1,869,162 (\$9,084,127) to the provision of medicines and appliances.

"The Insurance Medical Service, up to the present, has remained a service of general medical practitioners. It provides such services as an ordinary general practitioner gives to his private patients. It does not provide specialist services. In this respect it has laboured under unforeseen disadvantages. It was never contemplated in the early days of national health insurance that in the thirteenth year of medical benefit the general practitioners of the service would be driving a solitary furrow—working without any provision by the state in the form of assistance from colleagues possessing special experience and skill in other fields of medical science

and art. Before medical benefit had been in operation twelve months the question of providing a comprehensive scheme of consulting, nursing and laboratory services was prepared, and the necessary funds were voted by Parliament. The war, however, was fatal to the scheme, and the money was not available. But the need for the additional services never ceased to be felt. It was expressed strongly in the evidence placed before the Royal Commission on National Health Insurance and is fully recognized in the Report of the Commission."

A feature of very great importance in this system of medical service is the free choice of doctor by the insured person. An insured person may at any time change his doctor, and, as a result, since 1924 less than 1 per cent of insured persons have expressed their dissatisfaction by change of doctor. Furthermore, the fears entertained that insured persons would feign illness to secure benefits have not materialized. Dr. Alfred Cox, Medical Secretary of the British Medical Association, in a review entitled "The Medical Profession and Health Insurance in Great Britain", which was published in 1925, wrote: "Experience has shown that malingering is nothing like as common as many feared it would be." In the British scheme of sickness insurance the capitation fee per insured person is 9 shillings per annum and the average number of attendances per insured person is 3.8 according to figures obtained by the British Medical Association. Thus, the average fee for each item of attendance is 2s 6d. On the average, it is stated one of these attendances would be a domiciliary visit and the others office visits.

According to Dr. Cox, the broad results of the British system, so far as the public is concerned, are: (1) a greater sense of security in time of sickness on the part of the whole insured population; (2) a service which, in spite of its incompleteness, gives a large number of the population ready access to medical treatment of a kind superior to what they had in pre-insurance days, and a guarantee as to quality of service greater than private patients possess; (3) a greater interest in the question of medical service on the part of the community in general; (4) a realization that the present service is incomplete and a desire to make it complete for all those at present insured, with an extension to their dependents in the near future.

So far as the medical profession is concerned there are: (1) a feeling of greater financial security among the doctors who serve the industrial population; (2) certain restrictions on

the liberty of the individual doctor in his dealings with his insured patients; these may or may not be inevitable in a system in which a third party, the state, intervenes between the doctor and patient, but they are certainly resented by many doctors and by many patients. (3) an increasing sense of the collective responsibility of the medical profession for the quality and standard of the service; and (4) a strong conviction that "the price of liberty is eternal vigilance," with a corresponding increase in the belief of the profession in the necessity for strong organization for their own protection.

In 1924 in the section on Medical Sociology of the British Medical Association, a symposium on health insurance was held to which I desire to direct attention. Representatives of all interested groups in the community had a place on the program. A detailed account of the proceedings of this meeting was published in the *British Medical Journal* of August 2nd, page 167.

I should like to suggest that a splendid opportunity is afforded the organized medical profession of this country, to undertake a task of national interest and importance as follows; to ascertain whether adequate and satisfactory medical service, preventive and curative, is within the reach of all persons in need thereof; to learn whether the present volume of sickness with its attendant economic loss may be lessened; if so, to suggest ways by which this might be achieved; to study the remedies already introduced elsewhere for the alleviation of analogous conditions; and, finally, to bring forward specific recommendations to the proper bodies, governmental and voluntary, so that appropriate action may be taken.

The spirit of scientific enquiry should animate such an undertaking. A dispassionate and wholly objective attitude of mind is essential if information of any value is to be obtained. The responsibility cannot be evaded, nor can the work involved be delegated to others.

An Address

ON

ABDOMINAL SURGERY AND THE GENERAL PRACTITIONER*

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THE title of this paper, "Abdominal surgery and the general practitioner," might be construed either from the point of view of what surgery the general practitioner should do, or from the point of view of when he should advocate surgery in certain abdominal conditions. I have decided to discuss the subject from the latter aspect, for the reason that the surgery which should be done by the general practitioner is purely a matter between himself and his conscience, and is something about which I am not qualified to advise.

First, then, let us consider the question of gastric and duodenal ulcer, and gastric carcinoma. It is essential in dealing with these conditions that every diagnostic means be utilized in arriving at a conclusion as to whether or not

such lesions are present. There is a definite tendency to arrive at a diagnosis, particularly in gastric and duodenal ulcer, by short-cut methods. If a patient has typical hunger pains, coming on at a period of one and a half to two hours after meals, associated with heartburn and relieved by alkalies, with a defect in his gastric or duodenal outline as shown by x-ray, a diagnosis of gastric or duodenal ulcer is frequently made. This, we know, results in many patients being thus stigmatized, and will result also in uncertainties as to whether or not they are or are not relieved by certain measures. Inasmuch as the treatment of gastric and duodenal ulcer involves either a prolonged medical regimen or a surgical operation, either of which consumes a certain amount of time and money, then the diagnosis should be arrived at only after painstaking investigation.

One of the most important features in the

* Delivered at the annual meeting of the Province of Quebec Medical Association, at Sherbrooke, September 18th, 1928.

diagnosis is the history, and it must be carefully taken. In dealing with the history of suspected gastric or duodenal ulcer, it is well for practical purposes to assume that the history in both lesions is quite similar, and that from the history alone it is not possible to distinguish between the two. The symptoms of both gastric and duodenal ulcer are similar because they are, in both cases, largely related to the pylorus. Whether the ulcer be in the lesser curvature of the stomach or in the duodenum, there will be pylorospasm, usually with hyperperistalsis, and the pain and high acidity so frequently associated with these lesions is a direct result of the altered physiological activity of the pylorus.

It is probable that hyperacidity is directly related to the pylorospasm which goes with gastric and duodenal ulcer. It is probable that there is not an increased output of hydrochloric acid, but as the result of interference with the emptying of the stomach there is an accumulation of acid. It is probable also that the relief which follows gastroenterostomy, and also partial gastrectomy, is related to overcoming the undesirable effects of pylorospasm. If a gastroenterostomy be done, then no matter how much pylorospasm there be, it will not be possible for a large acid gastric secretion to accumulate, and in addition to the escape of acid gastric contents through the new opening there will be regurgitation of alkaline contents into the duodenum, both factors favourable to the relief of the hyperacidity which so frequently accompanies ulcer. It is probable also that the relief occasioned by partial gastrectomy has to do with the removal of the pylorus and the neutralization of the gastric contents by the alkaline jejunal contents. It is evident, therefore, that the histories of gastric and of duodenal ulcer may well be regarded as similar.

One of the characteristic features of gastric or duodenal ulcer is its periodicity, and this factor should always bear weight in favour of ulcer as opposed to carcinoma and other lesions. Sippy has described five well marked features in a given uncomplicated ulcer case in the same individual, which it is well to bear in mind. They are as follows: (1) that in a given individual pain always occurs at the same time; (2) that during the active stage of the ulcer there is an increase in gastric acidity, (it should be borne in mind in this connection, however, that

the acid in gastric ulcer tends to be much lower in amount than is the case with duodenal ulcer); (3) that aspiration of the gastric contents tends to relieve the pain; (4) that the neutralization of gastric acidity with an adequate dose of alkali will also relieve pain; and (5) that the employment of an albuminous meal of sufficient quantity will likewise relieve pain.

Regarding x-rays, it should be remembered that the interpretation of ulcer solely from x-ray plates is not as reliable as when fluoroscopy is also employed. By means of fluoroscopy waves may be watched as they pass from the stomach over the pylorus, and the emptying and filling of the duodenum repeatedly seen. The patient can be turned from side to side, and much more valuable evidence may be obtained when fluoroscopy is added to the diagnostic measures. One should remember also in relation to x-rays that many conditions, particularly pericholecystic adhesions, produce changes in the duodenal outline and its ability to fill completely, and that x-ray evidence is of value only when correlated with clinical findings.

The determination of the presence or absence of occult blood in the stools, with the patient on a proper diet, and without tooth-brushing, is of considerable value, particularly as to whether or not the blood persists in spite of treatment, in determining the presence or absence of duodenal ulcer. Its persistence in spite of adequate treatment should make one suspect either failure of the ulcer to heal or the possibility of malignancy in the lesion.

As regards the treatment, there have been in the past two schools, regarding the treatment of gastric and duodenal ulcer, those who enthusiastically advocated surgery, and those who avoided surgical measures, depending rather upon medical measures. It is our practice to assume that surgery is not a primary method of treatment of ulcer; that, on the other hand, the diagnosis of ulcer having been made, there are certain definite indications for surgery. It is obvious, for example, that a patient's situation in life may be such that he must undertake some method of treatment which offers immediate possibility of relief. In such a case it is not advisable to submit the individual to a prolonged trial of medical treatment.

Repeated hæmorrhages in spite of adequate medical treatment are an indication for surgical

treatment. They are not an indication for surgical treatment, however, if the patient has not been on a strict, thorough and adequate medical regime. Many patients have come to our clinic who have had hæmorrhages, and when put upon adequate medical treatment have never bled again; they have been relieved of their ulcer symptoms, and their gastric defect has disappeared. We therefore have assumed that hæmorrhage is an indication for surgical treatment only when it occurs in spite of what we consider adequate medical treatment.

There should be no surgical intervention immediately after hæmorrhage in gastric or duodenal ulcer, if at all avoidable. There is no situation which is more likely to be followed by fatality than immediate operation for bleeding gastric or duodenal ulcers. In a great majority of instances hæmorrhages from gastric and duodenal ulcers will not be fatal, and to-day, with transfusions available as they are, rarely should there be a death as a result of delay. Gastric operations, therefore, for hæmorrhage should be undertaken only after the blood volume has been restored to something approaching its normal status.

Perforation is, of course, an indication for immediate operation; in doubtful cases I would recall to your minds the value of x-ray examination of the upper abdomen, since in many cases of perforation a bubble of gas which has escaped from the stomach or duodenum can be demonstrated underneath the diaphragm.

Pyloric obstruction is an indication for operative procedures, but not to the degree which it was considered to be a few years past. It used to be said that a twelve- and, certainly, a twenty-four-hour residue was an indication for operation. In our experience with these conditions we have rarely found that the obstruction which goes with the acute stages of an ulcer is an immediate indication for operation. The cause of obstruction during the acute symptoms of ulcer is not cicatrix, but largely the result of pylorospasm, plus the exudate which goes with ulcer activity. If one will recall the two types of pyloric obstruction; (a) that which occurs during the acute stages of ulcer; and, (b) the true scar contracture, it will be realized that one cannot have active ulcer symptoms at the same time as cicatricial obstruction of the pylorus. Cicatricial obstruction of the pylorus can only

occur as the result of ulcer healing, replacement by scar tissue, and later contraction. Therefore, the symptom associated with this type of lesion is vomiting alone, as a result of mechanical obstruction; while in pyloric obstruction from an acute ulcer there is the typical train of ulcer symptoms.

With the above in mind, it has been demonstrated again and again by the gastroenterological department of our clinic that a majority of patients with pyloric obstruction associated with acute ulcer symptoms may be relieved by rest, diet and alkalization. In practically all instances under this management our gastroenterologists have been able to cause the pylorus to re-open and the stomach so to empty itself that immediate operation has rarely been necessary. Given, however, the other condition, that of pyloric obstruction due to cicatrix, then gastroenterostomy becomes necessary and is the proper procedure.

The question of malignancy and malignant degeneration in gastric ulcer has been dealt with in a different way in recent years. It has been stated and accepted by many that there is a high percentage of malignant degeneration in gastric ulcer, and upon this basis it has been assumed that nearly all gastric ulcers are dangerous because of the possibility of their transformation into carcinoma. We now know that this is not so, and that probably considerably less than 10 per cent of gastric ulcers show malignant degeneration. For this reason the mere presence of a gastric ulcer does not warrant us in assuming that it should be removed because of the danger of malignancy.

We have in the past had considerable difficulty in determining the presence or absence of malignant degeneration in gastric ulcers, particularly in the borderline case suspected of having such a possibility. There is no difficulty in diagnosing carcinoma of the stomach in a patient who is entirely without gastric acid, and who shows lactic acid and the Oppler-Boas bacillus, together with a typical moth-eaten outline of the stomach on x-ray examination; and the indication for radical operation is clear in such a case. Given, however, the patient with gastric acidity, and with an uncertain x-ray picture, in whom, however, malignant degeneration is suspected, then the problem becomes difficult. In such cases in the past we have been led at times

to exploration, and we have learned that this procedure is not helpful. When we can see metastases, such as the pearly peritoneal plaques, frank carcinoma can be recognized immediately, but even after exploration and examination we know of no way whereby we may distinguish the possible presence or absence of malignant degeneration in the chronically indurated ulcer not obviously malignant. It has been our experience that when we have explored such doubtful cases we have usually eventually resorted to partial gastrectomy, fearing to leave behind a malignant lesion. Having removed such a lesion, if the pathologist has reported it as a benign ulcer and a fatality has resulted, we have felt conscience-stricken in that the patient was not given his opportunity with non-operative treatment.

For the above reasons, therefore, we have sought help in distinguishing between ulcer and possible malignancy in this borderline lesion, and have submitted such patients to a trial of at least two weeks of treatment in bed, with rest, diet and neutralization, carefully watching the effect of this procedure upon the crater of the ulcer as shown by the x-rays, and upon the daily appearance of occult blood in the stools. When the x-ray outline of the ulcer crater has continued progressively to diminish in size and occult blood has disappeared from the stools under this plan of management, we have felt justified in assuming that the lesion was benign and have felt justified in not undertaking its treatment by partial gastrectomy. When, on the other hand, the outline of the crater of the ulcer, as shown by the x-ray, has not changed in character as the result of rest, regime and alkalinization, and particularly when occult blood in spite of these measures has persisted in the stools, we have felt justified in immediately submitting the patient to radical surgical measures. This plan has proved of real value in our hands, and we have published it and advocated it many times as a help in these doubtful borderline cases where one may so readily go astray in either direction, by withholding surgical intervention improperly, or by employing it unjustifiably.

There are certain features in the history of the patient suspected of gastric carcinoma which are also of value. One should recall that gastric carcinoma is not characterized, as a rule, by

periodicity, that it is progressive in character, as is the rule with the symptoms of carcinoma wherever it is found. Many of the patients with carcinoma of the stomach complain of loss of appetite and even of a distaste for food, and the pain does not, as a rule, occur at a characteristic time, nor is it relieved characteristically by food and alkalies. One should not, however, discuss the question of gastric carcinoma without stressing the point that it may be occasionally present, with all of the symptoms so typical of ulcer.

Having discussed now the indications for operation in gastric or duodenal ulcer, how do we manage a gastric or duodenal ulcer when a person with such a lesion comes to us for advice. We believe it must be admitted to-day that there is a considerable difference of opinion as to the selection of operative procedures in gastric and duodenal ulcer. We have, on the one hand, those who enthusiastically advocate partial gastrectomy and claim that it results in cures in nearly 100 per cent; and, on the other hand, those who as enthusiastically advocate gastroenterostomy and claim for it cures in 90 per cent. There are certain facts concerning the surgical aspect of gastric and duodenal ulcer which we must frankly face. They are as follows: that the mortality of partial gastrectomy, if the operation be applied without selection, must be high, because the more definite the indication for partial gastrectomy, that is, in the chronic indurated and eroding ulcers involving the pancreas and perforating through the walls of the stomach and duodenum, the more definite must be the number of fatalities. We must admit also that there is a real incidence of gastro-jejunal and jejunal ulcers following gastroenterostomy. The incidence of this lesion has been stated by those who claim low percentages to be as small as 2 per cent, and by those who claim high percentages to be as high as 34 per cent. It has been said by Lewisohn that gastro-jejunal ulcer was proved to be present in 18 per cent of his cases at operation. In all probability the incidence of gastro-jejunal ulcer is somewhere between the two. It probably is not 2 and it probably does not average as high as 18, and certainly does not reach 34 per cent. It is, however, real, and it must be considered as a possible complication in every gastroenteros-

tomy which is done. We must admit also that the mortality of gastroenterostomy probably will average considerably more than 2 per cent, nearer, perhaps, to 5 per cent. With these facts in mind we must admit that surgery cannot be justifiably undertaken in these lesions except when adequate medical treatment has had a thorough trial, or the indications for surgical intervention, as previously stated, are present.

We have had medical treatment in the past, but it has often been of an inadequate variety. We believe from our experience with more than five hundred gastric and duodenal ulcer in bed and under hospital management that the best plan of medical treatment is that which involves a three weeks' stay in the hospital, since with this plan rest may be obtained, the patient is under constant observation, and he may be to a considerable degree educated as to the management of his condition. Just as those who are interested in diabetes have succeeded in training their patients up to better management of themselves, so have we by insisting upon hospitalization been able to train these patients considerably in the better management of their dietary and alkaline regime.

We have taken the position that since surgical intervention is not so satisfactory as we would like to have it, when seen from a broad and fair point of view—and we must all admit that it is an extremely valuable procedure when employed in its proper place—then it is our duty to improve medical treatment up to the last possible degree, so that when we operate upon a gastric or duodenal ulcer, we may be conscience-clear in that we have first exhausted by faithful trial every possibility of non-operative procedures. Should the patient then be operated on and die, he has had a logical application of all procedures in their proper place, and should he fail to be relieved under medical treatment and surgery be advised, he must then accept surgery and its risks and complications, or go on with his pains and the dangers associated with a persisting ulcer, and the responsibility is his. This is the plan in our clinic for the management of gastric or duodenal ulcer.

When the patient comes to operation, how shall we select the type of surgical procedure to employ? We feel that partial gastrectomy, removing as it does the pathological lesion, and

resulting as it does usually in an anacid stomach, together with removal of the pylorus which plays such a considerable part in the ulcer syndrome, offers the best chance of complete relief of symptoms and protection against the recurrence of ulcer. We believe, however, that gastroenterostomy has its place in surgery, and probably as a single surgical procedure is the best gastric operation that we have, when considered from the point of view of mortality and applicability.

We feel that there is no one operative procedure for gastric and duodenal ulcer. We have explored every operative ulcer case with an open mind, arriving at the decision to perform partial gastrectomy instead of gastroenterostomy only after the abdomen has been opened, the patient's condition estimated, and the difficulties of partial gastrectomy carefully considered, with the lesion laid bare. In those patients with a stomach which can be delivered, and without involvement of the pancreas, where the partial gastrectomy can be readily done, and they are in a good general condition, such an operative procedure is unhesitatingly undertaken. Where, however, there is considerable uncertainty as to the patient's condition, and technically the procedure will be evidently difficult, then gastroenterostomy is undertaken. Where, however, repeated hæmorrhage has occurred, or where there is a suspicion of malignancy, the percentage of risk must be in some measure extended in order that the lesion itself may be removed.

One should bear in mind in undertaking operations on patients with gastric and duodenal ulcers that all patients are benefited by a period of preliminary medical treatment. Patients with active ulcer symptoms are much easier to operate upon if they have rested in bed for a week or ten days, have had their gastric acidity neutralized, their acute symptoms overcome, their fluids increased to bring the blood to normal volume, and their cell counts improved by transfusion.

There is a definite tendency on the part of surgeons to permit patients with gastric lesions to believe that if they are operated upon they can be discharged to eat and live as they see fit. This should not be the case, as such liberty undoubtedly plays a considerable part in the recurrences of ulcers which follow operations upon the stomach and duodenum. It must be

assumed that once a patient has had an ulcer, he falls into the group of patients who are susceptible to ulcer, just as do those treated medically, and whether he be relieved of his symptoms by medical treatment or by surgical treatment, it becomes necessary that he readjust his mode of living and his dietary habits so that most of the factors which had to do with the original production of his ulcer are removed.

I should like to say a few words now regarding gall-stones, and a few more regarding chronic appendicitis.

It is our feeling that we should attempt some change in our management of patients with gall-stones. There has been an inclination in the past not only to wait for typical gall-stone colic before diagnosing cholelithiasis, but also to wait for several attacks before advising operation. We should definitely change our attitude as regards this situation, since there are no harmless gall-stones.

Roughly, one meets with gall-stones of two types: (1) the pure cholesterol stone, often single, and in the beginning unassociated with an inflammatory stone, often single; and, (2) the calcium bilirubin stones, the result of infectious processes, associated with which are the end-results of round-celled infiltration, fibrosis, and scar tissue. Even the first type, the cholesterol stone, unassociated with infection, is not without danger, since mechanical blocking of the duct so frequently occurs, producing gall-bladder stasis, secondary migration of organisms, and super-imposed infection. So frequently and so persistently are gall-stones eventually associated with infection that interference with function, and eventual destruction of the gall-bladder, quite consistently result from long-standing cases. Gall-stones are dangerous for the further reason that the longer stones exist the greater the incidence of common-duct stones with their added dangers to the pancreas and liver. Gall-stones rarely exist without hepatitis and pericholecystic adhesions, features which are by no means desirable complications. While it cannot be said that hepatitis is of proved seriousness, nevertheless the early diagnosis and removal of gall-stones, if it will prevent hepatitis, is desirable. From the point of view, therefore, of advice,

we have taken the position that there are no harmless gall-stones.

The history associated with gall bladder disease is of value when typical, but early gall-stone symptoms may be and frequently are by no means typical. Indefinite upper abdominal discomfort in the right quadrant should make one suspicious of gall bladder disease, and the gall bladder should be investigated by means of the Graham dye test as to its possible pathological state in all uncertain cases.

One should recall, in connection with biliary tract disease, that jaundice is frequently not present in gall-bladder colic and also that jaundice is frequently not present even in the presence of a common duct stone. Given a patient with typical attacks of gall-bladder colic, each followed by an attack of jaundice, one may be extremely suspicious that there exists a common-duct stone; and, given a patient with attacks of biliary colic and jaundice plus elevations in temperature, the possibility of common duct stones becomes probable.

A very good point in the diagnosis and history of gall-bladder disease is the persistence of tenderness over the gall-bladder after the relief of pain in the right upper quadrant. This is extremely suggestive of gall-bladder disease.

It has been of interest, in reviewing the results of our experience with gall-bladder disease in the past year, to find that up to 1926 in 639 operations upon the biliary tract we opened and explored common ducts in 15 per cent. of the cases, and in this group of cases we found stones within the common duct in 8 per cent of the cases. From January 1, 1926, to May 1, 1928, we operated upon 198 patients with biliary tract disease, and of this number we explored the common duct in 30 per cent of the cases and found common duct stones present in 12 per cent. Note that in the second group of cases from January 1, 1926, through 1927 and the first few months of 1928, we increased the percentage of common ducts explored 100 per cent and increased the percentage of common duct stones discovered 50 per cent. This is of particular interest to us as demonstrating the fact that in all probability we had hitherto left behind many common-duct stones.

It is also of interest to note that the mortality in the group of gall-bladders, 639 in number, done up to January 1, 1926, was 5 per cent and

the mortality in the latter group of 198 cases done up to May 1, 1928, was 0.5 per cent, in spite of doubling the number of common ducts explored.

Dr. Cattell, in investigating the end results of our common-duct surgery, has found that the mortality of our common-duct cases was 10 per cent, but the interesting factor related to this is that in the following ten years of these cases an added 10 per cent mortality occurs, as the result, probably, of the infection within the common duct and liver. This, we believe, is a very strong point against the question of late gall-stone operations.

One should not discuss the question of biliary tract disease without considering the question of biliary obstruction due to malignancy, and in this connection we wish to speak particularly of Courvoisier's law, a portion of which has been of real value to us. Courvoisier's law states that in the presence of jaundice, a dilated and palpable gall-bladder is indicative of biliary obstruction due to malignancy, while a contracted gall-bladder is indicative of obstruction due to stone. It is at once obvious that the former portion of this law only is of value to the clinician, since examination with the unopened abdomen only permits the demonstration of the dilated gall-bladder. The law has many exceptions; and to make it of greater value to us we have modified it as follows: in the presence of jaundice, a dilated gall-bladder, with persistent and progressive jaundice, and persistently colourless stools, the obstruction is due to carcinoma of the head of the pancreas or of the common duct below the point of entrance of the cystic duct. It has been our experience that when these signs are present operative procedures, except for palliative measures, are without value and cannot hope to be curative. In such cases we feel that exploration is not justifiable, and operation should be undertaken only with the idea of anastomosing the gall-bladder to the stomach, duodenum or jejunum, cholecystenterostomy, with the idea of side-tracking bile and overcoming temporarily the intolerable symptoms associated with deep jaundice.

When painless and progressive jaundice is present, and persists without a dilated gall-bladder, then indeed must one be cautious both about diagnosis and about the indications for

surgical intervention, since it is extremely undesirable to operate upon patients suffering from jaundice of the so-called catarrhal or infectious type, particularly when the operation is done under a general anæsthetic. Painless and persistent jaundice should not be considered without realizing that silent common-duct stones may and do occasionally occur and produce jaundice. They rarely occur painlessly without some bile occasionally making its way into the intestinal tract.

Regarding gall-stones, I would like to sum up as follows: (1) there are no harmless gall-stones; (2) we should aim to make the diagnosis earlier than we have in the past; (3) the mortality of common duct stone operations is very much higher than for stones in the gall-bladder, and operation should be undertaken before they have occurred. (4) Courvoisier's law, modified as we have stated it, has proved of real value in our hands in determining diagnosis and operability in painless jaundice.

A very few remarks may now be added concerning a condition about which we feel very strongly, and that is chronic appendicitis. We have been through two phases in connection with chronic appendicitis. We have been through the stage when we removed a number of doubtful appendices under the diagnosis of chronic appendicitis, the end results of which were not good; and this led us to the position where we tended to lean over backward, almost believing that there was no such thing as chronic appendicitis. We are now in the following situation regarding this condition. We do not now believe that it is possible clinically to make a diagnosis of chronic appendicitis, except under the following conditions. Given a patient who has never before had pain and discomfort in his right iliac fossa, who then has a definite attack of acute appendicitis which subsides and then has recurring pain in the right iliac fossa, I believe, it may be assumed that one is dealing with a possible chronic appendicitis and operation may be advised with a clear conscience. We do not believe that the x-ray diagnosis of chronic appendicitis, based on plates, is of much value, since everyone experienced in surgery must admit having removed appendices as a routine in the course of other operations, buried in adhesions, kinked, displaced and even strictured.

Yet in many of these cases a review of the history would fail to reveal any evidence suggesting involvement of the appendix. If x-rays were taken, however, in such conditions, the condition of the appendix in these cases would be such that it could not fail to produce evidence that would lead the roentgenologist to report it as a pathological appendix. For this reason we believe that x-ray evidence in chronic appendicitis is of value solely when correlated with clinical findings, particularly pain and discomfort, and a tender appendix, as demonstrated by palpation under the fluoroscope. Under such conditions appendectomy for chronic, subacute, or recurrent appendicitis becomes justifiable.

What shall we do in the other conditions of vague right lower quadrant distress and discomfort? Here we must eliminate all other sources of trouble, such as kidney infections, ureteral stones, spastic colitis, posture, calcified lymph glands, etc., and if, after these have been eliminated as causes, pain persists, one may then remove the appendix as an exploratory procedure,

frankly admitting to himself and to the patient, if it seems wise, that it may or may not relieve him. But other conditions having been eliminated, the possibility of chronic appendicitis must be eliminated then by exploratory appendectomy. It is presumed, of course, in connection with these statements that the operation is never undertaken, even though other conditions have been excluded, unless symptoms justify it.

I feel very strongly about chronic appendicitis and I think we should all take the position that appendectomy should not be advised in chronic appendicitis lightly, but only after thorough and careful investigation. If we do this we shall markedly diminish the number of patients who are operated upon under the mistaken diagnosis of chronic appendicitis. Yet, I cannot close my remarks without making the statement that there is such a condition as chronic or recurrent appendicitis, that it is real, and that under certain conditions of careful investigation appendectomy yields satisfactory results in this affection.

THE ETIOLOGY AND PATHOLOGY OF SUB-ACUTE AND CHRONIC NEPHRITIS*

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TO understand the pathological changes occurring in the kidneys in such diseases as subacute and chronic nephritis, and to correlate them with the clinical findings, it is necessary to have some appreciation of the normal histological structure of the organ and its relation to function. It is difficult to correlate clinical with pathological findings but when one considers only the functional units of the kidney and relates them to the pathological changes it is much easier to understand the resultant clinical picture. A review therefore of the histology and physiology of the kidney is advisable before proceeding to a discussion of the pathology of these diseases.

HISTOLOGY

The kidney is made up of a large number of units called by Braus "nephrons". He estimates that each kidney consists of approximately one

million such units. A unit consists of a glomerulus with its tuft of capillary vessels projecting into the capsule (Bowman's capsule), and a tubule which drains it. The tubules of the individual units unite to form a system of collecting tubules and discharge their contents into the pelvis of the kidney. Each tubule can be divided roughly into three parts. First, the proximal convoluted portion; this is coiled up more or less about the glomerulus and is lined with a single layer of columnar epithelial cells. The second portion straightens out and dips down as a loop, (loop of Henle), into the medullary portion of the kidney. This is lined with a more cubical type of epithelium. The third portion, the distal convoluted tubule, has a lower type of epithelium and like the first portion is convoluted.

The blood supply of the unit which comes almost directly from large interlobular arteries breaks up into a cluster of capillary loops and projects into Bowman's capsule to form the

* A contribution to the Symposium on Subacute and Chronic Nephritis held at the annual meeting of the Ontario Medical Association, Kingston, May-June, 1928.

capillary tuft of the glomerulus. The capillaries of the tuft are thought to be covered by the reflected lining epithelial cells of Bowman's capsule, but are covered probably only in part by these cells. If the lining cells of Bowman's capsule do not completely cover the capillary tufts the blood at this point is separated from the lumen of Bowman's capsule by only a single layer of endothelial cells. As this is regarded as a semi-permeable membrane, the problem of urine excretion is reduced to a purely physico-chemical basis. The blood after passing through the capillary tuft of the glomerulus continues on through a rich network of capillaries which surround the tubules. Practically the whole blood supply of the kidney passes through the glomeruli before reaching the tubules.

PHYSIOLOGY

The kidney is essentially an excretory organ, eliminating certain nitrogenous and waste products from the blood. It works on the principle of simple filtration through a semi-permeable membrane in the glomerulus and by concentration of the filtrate in the tubule. This in general is Cushny's theory, "The Modern Theory." It states the general scheme of filtration and reabsorption as enunciated by Ludwig, but, appreciating the inadequacy of the known physical forces, supplements them as far as is necessary by the "Vital Activity Theory," set forth by Heidenhain. According to this theory the capillary tuft of the glomerulus acts as a pure filter. The lining endothelial cells form a semi-permeable membrane which allows for the passage of all the constituents of the blood plasma with the exception of the colloids. The filtrate therefore is a deproteinized plasma. In passing through the tubules it is concentrated and the proportions of the solid constituents altered by the absorption of water and certain threshold bodies. Most of the water is reabsorbed. The solid threshold bodies are reabsorbed in definite percentages depending upon their concentration in the plasma. The non-threshold bodies, such as urea, ammonia, sulphate and phosphate, not being absorbed are therefore highly concentrated.

The rate of the flow of urine appears to be dependent upon a balance between hydrostatic and osmotic pressures of the blood in the capillary tufts. If the hydrostatic pressure in the capillary system falls below 40 mm Hg. the flow of urine ceases. This is readily understood when it is realized that the osmotic pressure in

the capillaries due to the colloids in the blood, tending to hold the water in the capillaries, varies between 30 and 40 mm. Hg. The hydrostatic pressure above this must of necessity proportionately increase the rate of filtration and the flow of urine.

Changes in the concentration of the colloids also play a part in determining the rate of filtration and the flow of urine. A lowering of the concentration of the colloids of the blood leads to a reduction in osmotic pressure and a relative increase in the hydrostatic pressure. This allows for an increased rate of filtration, as can be demonstrated by intravenous injections of an isotonic solution of such a threshold substance as sodium chloride. A dilution diuresis is thus produced. The reverse of this is also true and a dilution diuresis can be abolished or reduced by intravenous injections of colloids such as gum acacia or gelatin.

Objections have been raised to the Cushny theory on the grounds of the unnecessary work involved in the filtration and reabsorption of such large quantities of water and solid constituents to produce the concentration of the urine as it is. Those who do not hold to this theory believe that the glomerular filter allows only for the passage of water and certain solids in proportions to make an isotonic solution. The waste solid constituents, they believe, are excreted by the epithelial cells of the tubules in the proportions as found in the urine. Experiments have been put forward which would seem to substantiate both theories. The problem is by no means settled. From the discussion however it is quite apparent; firstly, that the glomerulus has to do with the passage of water and crystalloid substances of the blood; secondly, that the tubules, particularly the proximal convoluted tubules, have to do with the handling of the solid elements of the urine; and, thirdly, the rate of flow of the urine appears to be dependent upon the balance between hydrostatic and osmotic pressures in the capillary system. These points are of significance when we come to a correlation of the clinical and pathological findings. The importance of the glomerular filter in the production of the symptoms associated with glomerular nephritis will be seen when we study the histological changes present in this disease. The signs and symptoms associated with toxic conditions of the kidney (nephrosis) can also be directly referable to the damage of the tubules.

PATHOLOGY

Although Van Helmont regarded the kidneys as the seat of the causation of dropsy, Cotunnus, as early as 1770, discovered that the urine excreted by dropsical patients was coagulated by heat. There is, however, no doubt that the honour of associating the true results of dropsy and albuminuria belongs to Richard Bright. In his reports on "Medical Cases," published in 1827, he distinctly ascribes albuminuria and dropsy to the altered anatomical condition of the kidneys. Since his time bilateral diseases of the kidney, recognized by abnormalities in the urine and by various clinical signs such as oedema, high blood pressure, etc., have usually been spoken of as Bright's disease. I think the term might well be retained. Bright originally classified kidney diseases into acute and chronic. Since his time the classification has been altered and enlarged considerably. Such terms as acute and chronic parenchymatous nephritis were substituted. In an endeavour to indicate more clearly the particular part of the unit involved the cases were later divided into glomerular and tubular nephritis with sub-headings of acute and chronic. Some, in an endeavour to distinguish toxic from inflammatory lesions, used such terms as parenchymatous nephritis and tubular degeneration. To include other types of cases terms such as interstitial nephritis and vascular nephritis were added. Out of the chaotic confusion of terms, Volhard and Fahr, finally brought order in their classification of kidney diseases, based primarily on the etiological factors and secondarily on the part of the organ chiefly involved. Included in this classification are those toxic, vascular, and non-suppurative inflammatory lesions of the kidney which are so commonly placed under the general heading of nephritis or Bright's disease. They are distinguished from the so-called surgical conditions of the kidney, such as suppurative inflammatory lesions, cysts, tumours and congenital anomalies.

The toxic or degenerative lesions are grouped under the "nephrosis". This term was introduced by Fr. Müller in 1905. It is used to indicate lesions which are toxic in origin, chemical or bacterial, and primarily degenerative in character, affecting chiefly the proximal convoluted tubules.

The vascular lesions are classified as arteriosclerotic. Karsner calls these nephrosclerosis. If the vessels alone are involved the condition is spoken of as a pure arteriosclerotic kidney; if on

the other hand they are associated with inflammatory lesions of the stroma or glomeruli it is spoken of as a combined nephritis.

The inflammatory lesions under this classification are peculiar in that they are non-suppurative in character. The reaction may be exudative or proliferative, depending upon the intensity and duration of the infection. In most cases it centres in or about the glomeruli and as such produces certain functional disturbances and clinical symptoms peculiar to this part of the kidney unit. Associated with the glomerular lesions secondary degenerative changes are found in the tubules. These appear to be dependent upon either a damage to the filter, allowing for the passage of toxins into the tubule, or on vascular disturbances produced by the proliferative changes in the capillary tufts.

In this symposium we are concerned particularly with the subacute and chronic nephritis. To conform with Volhard and Fahr's classification I should like to add the modifying terms of diffuse glomerulo, as indicating more specifically the nature of the lesions, that is, sub-acute and chronic diffuse glomerulonephritis. Where the inflammatory process is confined chiefly to the stroma it is called an interstitial nephritis. This may be acute or chronic.

ETIOLOGY

Etiologically, glomerulo-nephritis is thought to be bacterial in origin. This has been very difficult to prove. Its connection with the problem of focal infection however, has been fairly well established. In many cases the onset of the disease has been definitely associated with some upper respiratory infection such as the teeth, tonsils, sinuses, and bronchial tree. Exacerbations in the kidney have frequently been associated with the lighting up of a primary focus in the upper respiratory tract. Seemingly definite proof of this association is seen in the beneficial results produced in many cases by the elimination of certain primary foci of infection. Failure in some cases to obtain bacterial cultures from the kidney suggests that the reaction may be an allergic one. An analogy is to be found in the work of Swift *et al.*, who found that following streptococcal injections experimental animals developed a sensitivity which rendered them extremely susceptible to subsequent injections of minute doses of the same bacteria or their products. Cultures of the lesions at this time gave negative results. A theory recently advanced by Gray,

on the etiology of glomerulo-nephritis, offers a reasonable explanation of the tendency for the reaction to centre in the glomeruli and the failure to recover living organisms from the lesions. He suggests that the glomerular changes are the result of the concentration of a non-filtrable endotoxin in the capillary tufts. These toxins have their origin in the lysis of bacteria that have settled in the capillary tuft. The toxins being colloidal in nature do not pass through the glomerular filter and as a result become concentrated by the filtration of water through the capillary walls. This sets up the inflammatory reaction characteristic of this disease. The concentration of the toxin soon damages the filter and allows for its passage into the tubule. It is then concentrated in the tubules by the absorption of water and the tubular cells are damaged. This is most apparent in the proximal convoluted tubules because of their situation at the highest point in the tubular system. Chemical poisons, being crystalloid in nature, readily pass through the glomerular filter without producing any concentration in the tuft. They are, however, concentrated in the tubules and there produce in the lining cells the degenerative changes which are so characteristic of this type of poison.

Sub-acute Diffuse Glomerulonephritis. As has been stated above, this is a non-suppurative inflammatory condition of the kidney which is diffuse in character, and affects primarily the glomeruli. It usually starts as an acute process and, progressing into a subacute phase, runs, as Loehlein states, a "stormy course." The involvement of the glomeruli is much more general than in the acute and chronic forms. This probably accounts for the rapid progression to renal insufficiency characteristic of this type of disease. The reaction in the glomerulus is essentially proliferative in character and may be chiefly centred in the capillary tuft, the intra-capillary form, or in Bowman's capsule, the extra-capillary form. In the former, one finds a tremendous increase in the cellularity of the glomerular tufts with a consequent pinching-out of the capillaries and a diminution in the blood flow. A lymphocytic infiltration may be found about the glomeruli as well as in the capillary tufts. Owing to the damage to the capillary vessels, small extravasations of blood and thrombotic masses of red cells, lymphocytes, fibrin, and epithelial cells, may be found in Bowman's capsule. In the extra-capillary form proliferative changes occur, chiefly in Bowman's

capsule, with the exudative reaction in the neighbouring stroma. The lining cells of the capsule proliferate and desquamate into the lumen to form small crescentic masses which block the proximal end of the tubules. These crescentic masses in the process of organization form adhesions to the capillary tufts. The process eventually leads to complete fibrosis and functional obliteration of the unit.

"Every nephritis has its nephrosis." In diffuse glomerulonephritis secondary degenerative changes are always present in the tubules and may even dominate the picture. The nephrosis associated with subacute nephritis is very often much more marked than that seen in the pure toxic cases of nephrosis. While this may be true, the process is always secondary to the inflammatory changes in the glomeruli. The lining cells of the tubules, particularly the proximal convoluted tubules, are swollen. Their cytoplasm is coarsely granular and often contains fine droplets of fat. Many of the cells desquamate into the lumen and, packing together, form granular casts. Some of the tubules may be filled with red blood cells. With such an extensive involvement of the units, renal insufficiency soon follows, and death intervenes in three months to two years. Some cases subside into a sub-chronic stage and live longer.

From its gross appearance the subacute kidney has been described as the "large white kidney." No adhesions are apparent between the capsule and parenchyma unless the process has persisted for some time. The cortex is swollen, greyish-white in colour, and flecked with yellowish opaque areas of fatty degeneration. Pinpoint hæmorrhagic areas are seen scattered throughout the whole cortical substance.

Sub-chronic Glomerulonephritis. This represents a stage between the subacute and chronic. It is not a clear-cut entity, merging as it does on one side with the subacute stage and on the other with the chronic. The glomerular and tubular reactions are not so severe and general as those seen in the subacute varieties. On the other hand, the destruction of the kidney units with fibrosis is not so extensive as that found in the chronic type. The process is intermittently gradually progressive and may proceed a considerable time before symptoms become apparent. The kidneys are large and quite pale in colour. There are no petechial hæmorrhages to be found in the cortex such as are seen in the subacute

type. The capsule strips with some difficulty and leaves a finely granular surface.

Microscopically, the histological changes are somewhat variegated. Glomeruli in various stages of an inflammatory reaction are found. Some show evidences of a more recent reaction; others show successive stages down to complete fibrosis of the glomeruli and obliteration of the adjoining tubules.

Chronic Diffuse Glomerulonephritis. This, in its fully developed form, has usually behind it a long history of repeated attacks. During each attack a certain number of units or nephrons are destroyed. The continued destruction of units gradually exhausts the kidney reserve and at the same time proportionately lowers its resistance to new infections. A vicious circle is established which leads to diminishing function and ultimate renal insufficiency. One finds, on histological examination, a marked destruction of kidney units. The majority of the glomeruli are fibrosed and their tubules atrophied. The remaining units are hypertrophied, a response no doubt to an increased functional demand. Vascular changes may be quite prominent. On more careful examination one finds that the glomeruli are the centre of attack. Many of them are completely fibrosed and the tubules which drain them atrophied. The neighbouring stroma is collapsed and diffusely infiltrated with lymphocytes. These areas extend to the capsule and form adhesions with it.

Throughout the rest of the kidney one finds normal or hypertrophied units alternating with others in various stages of inflammatory or degenerative change. Most of the functional units are hypertrophied. The glomeruli are large. Their tubules are usually dilated and lined with a lower type of epithelium. It is questionable whether these units are functionally up to par. The remaining units show glomerular changes leading to complete fibrosis with hyalinization. The tubular changes, whether degenerative or not, will depend upon associated toxic conditions from a terminal infection in the kidney or other part of the body. In the terminal stages degenerative changes are prominent. Desquamation of the lining cells, with the formation of granular casts and the presence of red cells in the tubules, is prominent when death has occurred in an acute exacerbation. The atrophying tubules draining fibrosing glomeruli are frequently dilated, lined with flattened epithelium and filled with hyaline

casts. Such kidneys in the gross are much reduced in size. Their capsule strips with considerable difficulty and leaves a coarsely granular surface. The cortex and medulla merge into one another without much distinction. The kidney is a greyish-brown or yellowish-grey in colour, and small in size.

Chronic diffuse glomerulonephritis is frequently complicated by certain vascular changes. These are shown in nodular thickenings of the intima of the smaller arterioles leading to obliteration of many of the finer branches. This may be apparent in the afferent vessels of the glomeruli and as such leads to fibrosis and obliteration of a great number of them. Klotz thinks that virtually all cases of chronic glomerulonephritis show some type of arteriosclerosis. These vascular changes he believes are inflammatory in origin. They are important and may even dominate the whole pathological picture and modify considerably the clinical findings. Hypertension, for instance, may be dependent upon them, especially when associated with glomerular changes as well. In the pure arteriosclerotic kidney the larger arteries are more particularly involved. This results in a patchy scarring of the kidney without any particular general involvement of the individual units. As a result, few symptoms are produced unless there is extensive involvement.

SUMMARY

1. The functional unit of the kidney is a nephron consisting of a glomerulus and tubule with its blood supply.
2. The glomerulus has to do with the filtration of water and crystalloid substances while the tubule is concerned in the reabsorption or excretion, depending upon the theory held, of the solid constituents of the urine.
3. The theory of the concentration of bacterial endotoxins in the glomeruli as the cause of glomerulonephritis is worthy of consideration.
4. Subacute diffuse glomerulonephritis is characterized by extensive glomerular involvement which is essentially proliferative in character and runs a rapid course. The degenerative tubular changes are very marked in this type.
5. Sub-chronic diffuse glomerulonephritis is intermittently progressive in character. This is borne out in the variegated histological findings, namely, fibrosis, acute, subacute, and chronic reactions in the glomeruli, hypertrophic, atrophic,

and degenerative changes in the tubules, and scarring, with chronic inflammatory reaction in the stroma.

6. Chronic diffuse glomerulo-nephritis represents the end stage and shows extensive destruc-

tion of kidney units with replacement by fibrous tissue. Acute inflammatory and degenerative changes represent a terminal event.

7. The gross appearance of the kidney in each case is dependent upon the histological changes.

THE SYMPTOMATOLOGY, COURSE, CLINICAL AND LABORATORY FINDINGS OF SUBACUTE AND CHRONIC NEPHRITIS*

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SUBACUTE, subchronic, and chronic nephritis are names given to groups of cases which, in the light of prevailing ideas, all represent the same process. This process is the continued action of the inflammatory changes seen in acute nephritis until permanent destructive effects are produced which finally deprive the kidney of its power to function. The exudative inflammatory stage may persist from an attack of acute nephritis which has gone past the time limit for recovery from this disease, or, having subsided, it may occur repeatedly in the future in the form of acute exacerbations.

All cases in the groups under discussion have certain features in common which justify the diagnosis of nephritis—albumen and casts in the urine, some degree of cardiac hypertrophy, and some degree of arterial hypertension. Cases with these cardinal features, in which also severe clinical symptoms have persisted since an acute attack, are likely to die within a number of months. As cases of this sort progress certain hopeless end-stage phenomena appear within these few months, which are identical with those seen in other cases only after years of the presence of albuminuria and hypertension. Conversely, the albuminuric who is symptom-free for long periods may have at times attacks, severe or mild, with clinical phenomena which are identical with those seen in acute nephritis. Thus it has come to be understood that out of the total symptomatology of nephritis certain features, even in very mild form, may be recognized as belonging distinctively to the acute phase, and certain others just as distinctively to the chronic. This understanding has cleared

away much confusion. The addition of the tests for functional efficiency of the kidney make it still more possible to ascertain the position of the patient at any one time, or, by being applied at intervals, the rate at which his status is being lowered.

CHARACTERISTICS OF THE ACUTE PROCESS

The one constant feature of the original attack or of subsequent exacerbations is *hæmaturia*. This may be grossly evident or may be present only in microscopical degree. The modern conception is that long-continued cases have their efficiency gradually decreased by exacerbations, often so slight as to show only microscopical amounts of blood. For the protection of the patient warning should be given that slight malaise, headache, or oedema must be reported, in order that a search for red cells may be made. *Oliguria*, or lessening of the quantity of urine, occurring in the course of a long-continued case, must always suggest the recurrence of acute nephritis. *Oedema* is an early indication of any degree of oliguria. Blood volume being always maintained at a relatively constant quantity, fluid retained by impaired kidneys is speedily removed from the blood and stored in the tissues. Salt retention in the tissues accompanies the water storage. The oedema of nephritis is seen in various parts of the body, commonly in the face. This differentiates it from cardiac oedema, seen in the dependent parts. In nephritis, then, we have "subcutaneous oedema" as opposed to the "gravity oedema" of heart failure. *Acute convulsive phenomena*, in varying degree, belong to the acute process. They have as possible causes the action of the original toxin directly, vaso-constriction from its effects, or oedema of the brain (Volhard). These phenomena are, therefore, not to be identified with those

* A contribution to the Symposium on Subacute and Chronic Nephritis held at the annual meeting of the Ontario Medical Association, Kingston, May-June, 1928.

of "true chronic uræmia", in which we see long-continued and very marked retention of waste nitrogen. The convulsive symptoms of acute nephritis are usually ushered in by an increasing headache. The blood pressure suddenly rises, but not to the great heights seen in true uræmia. A complete epileptiform seizure may ensue, or it may be limited to one part of the body. Blindness may occur temporarily in one or both eyes. Vomiting, mental disturbances, œdema of the optic discs, and high blood-pressure may give a picture suggestive of brain tumour.

CHARACTERISTICS OF THE CHRONIC PROCESS

High Blood-pressure.—While many factors no doubt play a rôle here, yet we see a compensatory mechanism at work. When a sufficient number of glomeruli have been fibrosed to mark the case clinically as one of chronic nephritis, the remaining more or less healthy glomerules must over-secrete. To do this they must have more blood-flow. High blood-pressure provides this flow. As the case progresses we see the blood-pressures, both systolic and diastolic, increasing directly as the number of healthy glomeruli diminishes, until finally we have very high blood-pressure helping in the struggle to maintain life. In these cases the blood-pressure values are fixed rigidly, no treatment having any effect in lowering either the systolic or diastolic. The high figures seen in chronic nephritis arise over a long period. We do not see such elevation in acute conditions. In this respect extreme hypertension resembles true chronic uræmia, both requiring some time for their development.

Nycturia.—When efficiency of function becomes impaired to a certain degree, the kidney is then no longer able to do its day's work in working hours, and the patient has to arise once, then later more and more often, to empty a full bladder. In a case of severe illness, seen for the first time, in which albumen is discovered in the urine a negative reply to the question as to night-rising will at once abolish the fear that uræmia may be the cause of the present malady.

True Chronic Uræmia.—This is the clinical toxic manifestation of subacute and chronic nephritis. As opposed to the acute convulsive condition, formerly included under the term uræmia, the true chronic type has an insidious onset, and is asthenic in nature, as opposed to the sthenic nature of the acute convulsive type

of phenomena seen in acute nephritis. It occurs often when the blood nitrogen exceeds 100 mg. per 100 c.c. Perhaps the most distinctive characteristic is weakness and drowsiness with an inability to sleep. Headache, irritability, muscular twitchings, hiccup, are present. Delirium often occurs, sometimes resembling acute mania. Finally a deep stupor supervenes, but the patient may remain sleepy, yet mentally alert, until near the end. Digestive symptoms are distressing; anorexia comes early; nausea and vomiting are common. The mouth is dry, yet there is great thirst on account of the polyuria; the mouth is offensive and there is an odour of urine, due to the decomposition of urea in the mouth. Ulceration and necrosis occur in the digestive canal, giving rise to severe cramps, often mistaken for acute abdominal disease, and to diarrhœa and hæmorrhages. Pruritus and eczema or other rashes are common. Towards the end the heart fails, blood-pressure falls, and the urinary flow may cease.

Retinal Changes.—Hæmorrhages, œdema of the optic disc, and transitory blindness due to spasm are features of all forms of severe nephritis. Added to this in chronic nephritis during the terminal stages is the appearance of "cotton-wool" patches in the retina. It has long been known that patients presenting this whole picture of albuminuric retinitis have but a year or little more to live. As these changes may precede the stage of complete inefficiency of function in uræmia, they are useful in heralding this.

FUNCTIONAL TESTS

Three of these are very simple and require only an urinometer.

Two-hour test.—Without altering his daily routine of diet, the patient is directed to void every two hours during the day, measure the amount, and collect a sample. The night urine is saved in one lot from three hours after the evening meal until next morning, the amount being measured. In the normal individual there will be found a *variability of function*. The specimens which come closest after meals will contain the water from the meal, to which the kidney is very sensitive, and will hence be large in amount and low in specific gravity. The specimens before the next meal will be small in quantity and high in specific gravity, owing to the nitrogen of the meal now being excreted.

The night urine will average 13 oz. (400 c.c.), and will have a specific gravity of about 1018. The different specimens will have a specific gravity variation of seven to ten points, and one specimen will be 1020 or over. The patient will not have to arise at night because the kidney can complete its work in response to meals and provide itself with a rest period at night. The two-hour test, as will be shown later, finds its greatest use in revealing an early failure of function before definite clinical symptoms give warning of this danger.

Water Test of Volhard.—This is a test for the reserve power of the kidney to eliminate water and salt, the materials with which oedema is created. In the test a deliberate strain is imposed on the kidney which it is not necessary and would be dangerous to apply in the presence of oedema. Before breakfast, and after emptying the bladder, the patient drinks 50 oz. (1500 c.c.) of water during half an hour. Thereafter specimens are collected each half hour for four hours, and then for the rest of the twenty-four hours. The patient is allowed his usual intake of food and drink. In the normal case the water takes a little while to be absorbed. The blood volume then rises and the kidney responds with a quick diuresis, getting rid of a large proportion early. Most of this extra water should be eliminated in four hours and the greater part in the first two hours. The total quantity secreted in 24 hours should be about 2500 c.c. Figures for a normal test in half hour intervals should be, 80 c.c., 250 c.c., 400 c.c., 400 c.c., 150 c.c., 100 c.c., 50 c.c., 50 c.c. This test, like the preceding one, finds its greatest use when the departure from normal is only moderate, as the warning which it gives often precedes clinical evidence. Its variations will be described later.

Concentration Test of Volhard.—The patient is directed to eat substantial food and to abstain from liquids from one afternoon until the next. The urine is collected every three hours on the second day. By the afternoon the specific gravity should be 1030 or over. This is a test for the kidney's reserve power to handle nitrogen excretion, as the everyday conditions in which the two-hour test is applied may not contain the need for a specific gravity above 1020. The information given by this test is very valuable. It is unlikely that there is any constant nitrogen-waste accumulation in the blood if the two-hour

test gives a specific gravity as high as 1020. If the concentration test is normal as well, it is then evident that even an additional intake of protein will not be harmful, and no restriction of nitrogenous food need be imposed from the standpoint of elimination power.

Blood Nitrogen Estimations.—In patients seriously ill with thirst and digestive upset, in unconscious patients, and in patients with irritative conditions of the urinary path causing frequency of micturition, it may be impossible to apply the foregoing tests. In order to diagnose or to rule out nephritis with uræmia an examination for the amount of non-protein or waste-product nitrogen in the blood should then be made. Five c.c. of blood should be sent to a well equipped laboratory with some preservative, such as thymol and sodium fluoride in the tube. Either the total non-protein nitrogen or the urea-nitrogen may be estimated. The upper limit for the non-protein nitrogen is 40 mg. per 100 c.c. of blood; for the urea-nitrogen, 20 mg. per 100 c.c. When finally the end-stage of a case of chronic nephritis is reached, the limitation of protein in the diet will not suffice to control the nitrogenous waste products in the blood, and repeated non-protein nitrogen estimations will be necessary to indicate the advance of the disease, the simpler functional tests being of no use, owing to complete loss of variability of function of the kidney.

Two other useful tests have been devised for measuring the rate of secretion of a substance administered to the patient. In MacLean's test this substance is urea given by mouth; in the phenolsulphonaphthalein test, it is this dye injected subcutaneously.

CLINICAL PICTURES

In applying the foregoing observations, we find that four main clinical pictures emerge:—

1. Cases which extend beyond the short period, usually four to eight weeks, for acute nephritis, and remain "stormy" cases. To these the name *subacute nephritis* has been given, and they are doomed to end fatally in a few months. The reason for this is that the early inflammatory changes are being replaced by rapidly progressive fibrotic changes, so that the picture is a mixture of acute and chronic nephritis, and soon passes into the end-stage of renal inefficiency from destruction of secreting units. The symptoms are, at first, a prolongation of acute

nephritic manifestations, hæmaturia, oliguria, even anuria, œdema, and acute convulsive phenomena. With the oliguria more or less persisting, from the acute swelling in the glomeruli, in a short time the specific gravity becomes lower from the addition of permanent disease and the nitrogen waste accumulates until true chronic uræmia supervenes.

Sometimes patients with subacute nephritis are not very ill, but never become quite symptom-free following acute nephritis. Often the attack has been a mild one, but some œdema persists, the blood-pressure remains high, and the patient does not feel quite well. This means that progressive fibrotic changes are occurring fairly rapidly and this type of case is usually doomed to die of uræmia within two or three years. When the acute attack has been very mild the case often comes with albumin and œdema as the main features. There is then a temptation to classify the malady as the partial picture called nephrosis. A search for blood cells in the urine will tell the tale. The course of this subchronic nephritis may be foretold by the functional tests and symptom-complexes.

2. *Subchronic Nephritis—Stage of efficiency of function.*—These are the cases which become symptom-free after the acute attack, but continue to have albumen. This is the type that is so commonly picked up during insurance or other routine examinations. It is of great interest clinically because patients of this class have often been so sadly mismanaged in the past. Condemned to death in a year or two, and prescribed a meatless diet, which would, if followed, make them anæmic and weak, many bold spirits have gone their way unmoved by medical advice and have lived for twenty or thirty years to tell the tale. If this prolonged course occurs, such cases are likely to succumb eventually to vascular changes from hypertrophy and hypertension. But even then their lives may be prolonged by recognizing them as circulatory cases, instead of mismanaging them as uræmic cases. Cerebral symptoms from arteriosclerosis may give pseudo-uræmic symptoms, but a concentration test will give a specific gravity of 1028 or more, and a two-hour test may give one as low as 1010, and the blood nitrogen will not be elevated. It is never safe, however, to assume that a symptomless nephritic will long remain quiescent, and constant watch

must be kept for the acute exacerbation, and the functional tests must be applied at intervals. The majority of cases in this class sooner or later enter the next group.

3. *Subchronic Nephritis—Stage of beginning failure or relative inefficiency of functioning.*—Here the proportion of atrophied secreting units is beginning to tell. The two-hour test may make a good showing, but the concentration test may fail to give a figure much above 1020. Later, the two-hour test may fail to show a specific gravity above 1018. The failure may show itself first in the water and salt department, and a water test may show not so high a peak of diuresis in the early half hour specimens, a prolongation of secreting time, and perhaps not the total of 2500 c.c. for the 24 hours. There may therefore be a little œdema ensuing soon, or, from an excessive protein intake on occasion, nycturia. This may be a protracted period and one that, guided by the functional tests, may be made by management fairly symptom-free.

4. *End-stage Period—Chronic glomerulonephritis.*—Here we have to picture to ourselves three-quarters or more of the glomeruli and tubules of each kidney completely gone. Through the remaining units tremendous floods of pale urine are pouring, aided by very high blood-pressure. Hourly collections of urine would show an even rate of secretion going on through the whole twenty-four hours. The patient is then voiding as frequently at night as by day, or more so, there being a lag in the elimination of the day's waste-products because variability of function is lost. These products are "leached out" in constant small amounts by means of the great polyuria. This is a compensatory process, and so long as it lasts life is supportable, it may be for many months. When from further diminution of secreting units, or from lowering of blood pressure by vascular failure, oliguria begins, the rapid accumulation of waste products is inevitable. There is no longer the power to void concentrated urine and thereby to get rid of solids. In spite of restriction of the protein intake to the minimum that will support life, the blood nitrogen rises to high levels, 300 mg. per 100 c.c. The severe symptoms of true chronic uræmia then supervene. The total duration of the end-stage of glomerulonephritis is usually less than two years.

THE DIAGNOSIS, PROGNOSIS AND TREATMENT OF SUBACUTE AND CHRONIC NEPHRITIS*

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WITH an underlying concept of nephritis as a progressive disease, which, I think, is fundamental for the understanding of this condition, it will naturally be rather difficult to set bounds where the unhealed, acute renal lesion becomes subacute or subchronic and, again, where the disease enters the chronic phase. It cannot be said that all the changes, either functional or anatomical, take place at the same time or to an equal degree in different cases. Time as a factor is relatively unimportant; weeks or years may be required to produce an equal injury in different cases. The gross and microscopical pathology of the kidney is relatively unimportant in this differentiation. By this statement one does not mean that typical pathological pictures do not occur, but that the pathological pictures are a complex of permutations or combinations of different anatomical lesions, approaching in major degree one or another phase of kidney injury. Essentially, renal injuries in nephritis are inflammatory or degenerative, focal or diffuse, and acute, subacute or chronic in nature. Focal nephritis is usually a subsidiary manifestation in cases showing a severe bacteriemia. In subacute and chronic nephritis the inflammatory injury is diffuse in character, affecting chiefly the glomerulus. Some interstitial inflammation may also occur or may even be the main pathological lesion, but clinically this is not recognizable, except in so far as it affects the parenchyma. Tubular degeneration in some degree always accompanies the glomerular damage, but is infrequent as a major lesion among the subacute and chronic varieties. These considerations justify the use of the term diffuse glomerulonephritis.

Patients with acute nephritis whose recovery is delayed, who are subject to repeated exacerbations at short intervals, or whose clinical

symptomatology never becomes normal, may be regarded as having subacute nephritis. One may mark cases in which the first severe damage of the acute lesion has subsided, leaving signs (without symptoms) of continuing kidney injury of mild grade and usually some evidence of impairment of the reserve powers of the kidney, as being subchronic nephritis. Unless these patients die with an acute exacerbation and uræmia or intercurrent disease they pass into the third or chronic phase. In chronic nephritis we have a further degree of impairment of kidney efficiency denoted by fixation of the specific gravity of the urine at 1016 or less and characterized by the development of late symptoms, such as fatigue, cachexia, rise in blood pressure, and cardiac hypertrophy.

Subacute nephritis is a condition difficult of exact separation from the acute condition and, indeed, is usually diagnosed such at first. The acute onset following an acute upper respiratory infection is about as frequent as in the true acute nephritis, the symptomatology is the same, and usually there is an initial amelioration of symptoms which promises an early cure. The proliferative element, however, exceeds the exudative side of the inflammatory reaction. This becomes apparent through the long continuance of the condition in a somewhat less violent form and particularly through the frequency of signs of minor recrudescences of acute nature, such as frequent bouts of fever, of microscopical or even macroscopical hæmorrhage, or of oliguria. The albuminuria is exceedingly variable in degree but is usually considerable, and all varieties of casts, excepting the waxy, are found. The blood pressure rarely falls to normal, or rapidly rises again to values around 150 mm. Hg. The patient is seldom free from œdema and still remains of a pasty, puffy appearance if actual œdema is absent. A progressive diminution of kidney efficiency takes place and finally uræmia develops. The presence of the œdema and the raised blood

* A contribution to the Symposium on Subacute and Chronic Nephritis held at the annual meeting of the Ontario Medical Association, Kingston, May-June, 1929.

pressure, together with the absence of a major lesion such as a puerperal septicæmia or bacterial endocarditis, serves to differentiate this condition from a focal nephritis.

The subchronic group is perhaps the most important group of nephritics. These patients have become subjectively free from symptoms though not of signs, following an acute nephritis or their condition may perhaps be discovered accidentally without a recognizable past history of kidney injury. Albumen and casts are present in the urine, often red cells appear, the blood pressure gradually rises, and slight cardiac hypertrophy occurs with some thickening of the blood vessels. Often a certain degree of dyspnoea or oppression in the chest is noted. Œdema is not a constant sign and, indeed, may never be present, while in other cases it is well marked. Retinal changes occur in the cases with high blood pressure. Kidney efficiency, as determined by a water test and concentration test, varies with the stage, sometimes being almost indistinguishable from the normal, but gradually approaching the stage where variability of function is lost. Nycturia first appears in this stage. Salt is not well excreted and when given in any considerable amount is apt to be retained. Nitrogen is excreted in sufficient amounts except during an acute exacerbation. These are the ambulant cases of nephritis and it may be years, or even decades, before they pass into the chronic phase.

In chronic nephritis the patient gradually notices the development of a greater number of general symptoms than in other stages. Some of these are due to injury of the heart and blood vessels, while others are more or less directly related to the renal disease. A gradually developing cachexia is common, the subcutaneous fat is lost, the muscles become weak, the patient is always tired, a secondary anæmia is frequent, the skin becomes thin and pale and assumes a yellowish-grey tint, the hair loses its lustre and tends to fall out. The patient often complains of failing eyesight which is associated with a retinitis, hæmorrhages and plaque formation. The urine is pale and contains albumen, usually small in amount; seldom do red blood cells appear. Various kinds of casts (hyaline, granular and fatty) with leucocytes and epithelium are found in the sediment.

The volume of urine is increased and the specific gravity is characteristically low. Loss of the ability to vary the output of fluid and solids according to the intake is the pathognomonic sign of this stage of the disease. The specific gravity is low and fixed, not only in a two-hour test but also in a water test and a concentration test. In different cases the degree of renal compensation naturally varies, in some being sufficient for ordinary purposes but inadequate to excessive strain, and in others grading down to an absolute inefficiency incompatible with very long duration of life. Polyuria, as well as nycturia, is present. Indeed, polyuria is the means of compensating for the other deficiencies, and when it is destroyed, whether by acute exacerbation or more gradual deterioration, uræmia ensues. That the patient has polyuria, however, is not evidence of good ability to excrete water; rather the reverse is true. The water-excreting mechanism is reduced in efficiency and must be used at its best speed both day and night in order to excrete sufficient water. The average systolic blood pressure is 170-200 mm. Hg. and increases with the duration of the lesion. The left heart is hypertrophied, the impulse heaving; the blood vessels show a thickening of the wall, more particularly of the larger and medium sized arteries. Œdema is not often associated with this phase of nephritis, except as a result of cardiac insufficiency which sometimes develops. Salt excretion is poor, the percentage never being high, though retention is avoided if the volume output per day is sufficiently great. Added salt is retained. Similarly, the excretion of nitrogen may be sufficient under strict diet, but excessive intake must be avoided.

DIFFERENTIAL DIAGNOSIS

For nephritis there are no infallible pathognomonic signs or symptoms. The symptomatology may be protean, may appear to involve any or all of the other systems of the body, but, when the physical signs are also considered, only one system, the circulation, presents sufficiently similar pathological derangements as to require much differentiation. Our commonest mistake in diagnosis is to regard œdema and rise in blood pressure, when they are associated with albumen and casts in the urine, as due to a nephritis, forgetting the fre-

quency with which these signs also occur in patients with circulatory impairment.

Cardiac decompensation is most frequently confused with subchronic nephritis, and arteriosclerosis with chronic nephritis. But cardiac decompensation is so frequently associated with arteriosclerosis that we also find the combination confused with pure renal lesions. In an excess of zeal for differential diagnosis one should not neglect the possibility, even the frequent probability, in the late stages of nephritis of these lesions being all exemplified in the one individual, and thus supply inadequate treatment for the patient. One must also confess that sometimes the differential diagnosis must await the results of treatment. Nevertheless, in a large proportion of cases the differentiation is relatively easy. It depends on the correct assessment of the complete history and clinical examination of the patient, and if we here pause to indicate a few of the high lights of diagnosis it should not be thought that other signs and symptoms may not assume a greater degree of importance in a particular case. It may be noted that I have omitted to stress the laboratory in diagnosis. This is not because I am unfamiliar with the contributions which a laboratory can make to clinical diagnosis, but because I rate the laboratory investigation as a phase of modern clinical diagnosis, fully as important to the clinician as the operating room to the surgeon, and, like it, furnishing evidence which must be weighed with other data in coming to a decision on diagnosis, prognosis or treatment of the patient.

The similarity between subchronic glomerulonephritis and cardiac decompensation ceases when we have noted the possible presence in both of oedema, fluid in the somatic cavities, cardiac enlargement, a moderate rise in systolic pressure, albumen, possibly blood and casts in the urine, nycturia, and perhaps a slight increase in the non-protein nitrogenous substances in the blood. Even among these symptoms there is often a difference in the two diseases. For instance, generalized oedema and puffiness are much more frequent in renal than in cardiac disease; cardiac enlargement is less in nephritis, and is due to hypertrophy rather than to dilatation and hypertrophy. The small pulse pressure of a failing circulation is absent in nephritis, and the nocturnal urine is higher

in specific gravity in the cardiac case than in the chronic nephritic. But, apart from these rather minor points of difference, the clinical picture as elicited from the history is entirely different in the two types of disease and, as a rule, furnishes unmistakable evidence for differentiation. The physical findings are also valuable. Murmurs, thrills and arrhythmia, cardiac dilatation, diffuse weak apex beat, heart sounds which indicate a poor muscle quality, enlargement of the liver, and moisture within the lung itself, are exclusively cardiac signs. From the renal side somewhat less evidence is available. Retinal changes, exudates, if present, indicate a renal lesion. Retinal hæmorrhage may occur in either group. In both cases oliguria and nycturia may be present but in cases of cardiac failure the urine has a relatively fixed specific gravity between 1020 and 1024, a comparatively high level. In subchronic glomerulonephritis the kidney is less able than the normal to vary the specific gravity and volume of the urine in accordance with the intake of fluids and solids, but retains this function better than the chronic nephritic who has fixation of volume output and fixation of specific gravity at a low level. The response to supportive treatment for the heart and to diuretics is also evidence for differentiation. The value of diuretics is almost exclusively observed in cardiac cases.

A considerable proportion of arteriosclerotics have albuminuria with casts in the urine. With excessive intake of fluids they must get up at night, though this is unnecessary with a reasonable intake. With arteriosclerosis, high blood pressure, cardiac enlargement, and often retinal changes resultant upon sclerosis of their retinal vessels, these patients are frequently confused with chronic nephritics. Differentiation is dependent upon determination of their reserve kidney efficiency, when it will be found that the arteriosclerotic has little, if any, impairment of function. He is merely growing old and it is indeed surprising that his kidney shows so little evidence of it when compared with other organs. Nevertheless, a few of the arteriosclerotics, say 15 per cent, do show impairment of kidney function with some evidence of a late mild inflammatory reaction. In such cases the damage to the parenchymal tissue, due to the vascular changes and consequent

impaired nutrition of the cells, may be extreme and, if you choose, this may be looked upon as mainly an arteriosclerotic atrophy of the parenchyma. Such cases are often quite difficult to differentiate from chronic glomerulonephritis. The vascular change is more marked, the cardiac enlargement is marked, the blood pressure is above 200 mm. Hg., while subchronic nephritides seldom reach 200 mm. Hg., and only a small proportion of the chronic nephritides exceed this value. The retinitis of these cases is somewhat different. Primary arterial sclerosis with contracted vessels, hyperæmia of the disc with papillary and peripapillary œdema of a thin serous type with "cotton-wool exudates" are seen. Hæmorrhages and the macular star may be present in both types of lesions, but arteries of normal size, anæmic discs, and dense retinal œdema, are more characteristic of chronic glomerulonephritis. The history of the case may also give some clues. The differentiation is really of small importance, since largely by nutritional degeneration of the parenchyma the patient has arrived at the same state of functional kidney inefficiency as we find resulting from the inflammatory lesion and he is now subject to the same disabilities and dangers as the chronic nephritic.

Pyelitis, pyelonephritis and pyonephrosis may be easily differentiated from nephritis by the clinical history, chills and fever, and large number of pus cells in the urine. Kidney tumour with localized pain indicates relative or absolute blockage of the ureter by stone or other means. Pus casts also appear in the urine in pyelonephritis and sometimes in pyonephrosis.

Attention should also be called to the frequency with which myxœdema in a somewhat atypical form, particularly cases without marked mental changes, and the cases showing dependent œdema with advancing cardiac weakness, poor heart sounds, rapid heart rate, with perhaps some rise in blood pressure, is confused with nephritis on account of the associated presence of albumen, casts and possibly blood in the urine. Such a myxœdema of the heart and kidney is not at all infrequent. The history, other signs of myxœdema, a low basal metabolic rate and the response to thyroid treatment will point to the correct diagnosis.

PROGNOSIS

Prognosis in subacute renal disease is, on the whole, unsatisfactory. For the most part, such cases represent a later stage of acute nephritis in which the proliferative element has succeeded the exudative stage of the inflammatory process with more than usual activity. The signs of acute inflammation persist or recur at intervals of a very few days, and the patient has no period in which he feels entirely well. The most important feature bearing on prognosis in these cases is the discovery and eradication of the focal infection which is continuing the disease. A few recover spontaneously, some show defervescence and pass into the subchronic stage, but for most the course is relatively short, though perhaps in some cases as long as three years.

Prognosis in subchronic renal disease must be guarded. Cure is, of course, out of the question. The time to cure subacute or chronic nephritis is before it starts or, in other words, the treatment of the acute lesion must be efficiently and diligently carried out. The proportion of uncured acute nephritides condemned to die of the chronic form of the disease is unnecessarily high, due to failure on the part of the patient and, oftentimes, the physician to recognize the necessity for adequate treatment of the earlier manifestations of the disease.

In subchronic nephritis the situation is not without hope, however. The rate of deterioration of kidney efficiency is exceedingly slow, and such patients live for many years if carefully guarded. The cause of early death in this phase is repeated exacerbations. Often a patient with quite enough kidney tissue for his needs, but with a deficiency in reserve power, is suddenly plunged into uræmia by an acute exacerbation of his disease. Apart from such untoward happenings, preventable accidents in a large measure, the patient with subchronic nephritis with adequate treatment runs a course of even twenty years with gradually decreasing kidney efficiency. Associated or intercurrent diseases play a part in the prognosis of the kidney lesion, and always for the worse.

Kidney efficiency tests, particularly functional reserve tests, play an important part in determining the rate of deterioration and modifying treatment suitable for the particular

phase. Some patients indeed, while still showing albumen and casts show little if any decrease in functional efficiency, while others, more severe or more advanced, show a failure to excrete water in the normal manner or to concentrate to the degree expected of a normal kidney. Since in these cases the kidney reserve is only partially destroyed and the remainder quite able to carry on, one finds no important increase in the non-protein nitrogen content of the blood. Indeed, it may be said that, if the kidney shows ability to concentrate in a single specimen to 1020 specific gravity and the volume output per day is 1000 cubic centimetres or more, that patient is in no immediate danger of nitrogen retention or uræmia. Higher volumes compensate for lower specific gravity and *vice versa*.

In the nature of things the prognosis of chronic nephritis must be much less favourable. The duration of life, however, is exceedingly variable, being measured in months or, at most, a few years, and again determined mainly by the onset of a terminal acute exacerbation in a large proportion of cases. Since such cases have little remaining reserve kidney, efficiency tests, such as the water test and the concentration test, so useful in diagnosing the condition, are of decidedly less value in following the case or in yielding information useful in prognosis. In this stage of the disease the blood retention tests become most valuable for prognosis and treatment. Of these the estimation of the non-protein nitrogen, being the simpler to perform, is the most valuable. A high non-protein nitrogen in the blood, increasing in spite of treatment, is of serious import, while a reduction in non-protein nitrogen in response to reduction in the protein intake, is of favourable import. Estimation of the blood creatinine when the non-protein nitrogen is less than 60 mgm. per 100 c.c. seldom repays the trouble of doing it. The normal value of blood creatinine is 1 to 2 mgm. per 100 c.c. As it rises the prognosis becomes progressively worse and, as Myers and Lough have shown, values over 5 mgm. per 100 c.c. are usually succeeded by a fatal issue within about four months.

More general conditions in the patient must also influence the prognosis. Infection, the condition of the arteries, efficiency of the heart, etc., must also be taken into account in arriv-

ing at a prognosis. The old dictum that the chronic nephritic in whom retinitis is well marked has less than two years to live is reasonably well founded. While sometimes incorrect, the impression I have is that the time stated is somewhat too long for the average case.

TREATMENT

Treatment of the later stages of nephritis may well be prefaced by a few words on prevention of the condition. Acute nephritis, it is now well recognized, is most often associated with an upper respiratory tract infection. Occasionally it may be traced to an acute infectious fever, *e.g.*, scarlet fever, but this is certainly less frequent than is sometimes supposed. Speaking generally, the treatment of acute nephritis is adequate rest to the injured organ. In many cases rest must be prolonged and is justifiably prolonged for months, in complete disregard for the older viewpoint that nephritis of six weeks' duration has become chronic and incurable. In Volhard and Fahr's series sixty-eight out of seventy-one cases of acute nephritis eventually recovered. In many cases of chronic nephritis the onset is obscure. Possibly some of these may have originated as an interstitial nephritis following infectious fevers, and only became manifest clinically when severe injury to the parenchyma had taken place. It seems equally or even more probable, however, that the same cause which produces the clinical acute nephritis which later becomes chronic, upper respiratory tract infection, may also cause kidney injury of so mild a degree that its signs or symptoms pass unnoted until discovered in a routine examination of the patient. Adequate treatment of these infections, with removal of all foci of localization, should be undertaken as a measure of insurance to reduce the incidence of nephritis as well as other so-called "degenerative" lesions of the later years of life.

The patient whose renal injury lasts more than a few months has little chance of becoming entirely well. In some cases a delayed healing may take place: it is, however, healing with a scar, not a *restitutio ad integrum*. Others, less fortunate, may get better, but not well. Once the disease becomes productive it necessarily becomes progressive or continuous, since by this

time it has involved the blood supply to the kidney unit or nephron. The glomerular arteries are end-arteries, and no collateral circulation exists capable of taking on the function of supplying blood to that glomerulus or the tubular cells associated with it. The treatment for sub-acute nephritis is in most particulars the same as for acute nephritis—prolonged rest, most of the time in bed, restriction of the work of the kidney by cutting down fluids, salts and proteins, by using a diet composed of milk, cream and the foods high in carbohydrate or fat content, a regular morning saline, preferably magnesium sulphate, as it is not absorbed and so does not increase the work of the kidneys. These cases are mostly failures in the treatment of the acute phase, either on account of severity of the lesion or inadequacy of the treatment. Our commonest source of failure is the failure to find and eradicate a focus of infection, which is continuing the injury. Our next commonest failure is a failure to treat the case long enough—to abandon it as hopeless.

The treatment of subchronic nephritis is, as previously mentioned, preventive, but the importance of focal infections as the cause of further injury should not be minimized or overlooked, as they are potent causes of acute exacerbations. Each case deserves a most careful search of the tonsils, sinuses, prostate, or it may be the appendix or gall bladder, and even that much overworked focus, the teeth, for evidence of disease. Abnormal conditions found should be rectified. These are not only possible exciting points of a new exacerbation but also are a menace to the general health of the patient on which his resistance to other infection depends. The general health of the patient must also be protected in other ways. The patient should be taught the necessity for observing proper precautions against the elements; his occupation should not involve undue exposure; he should dress for the seasons; should avoid undue fatigue; and should obtain adequate rest.

Dietary treatment is not least important, since it bears a direct relationship to the efficiency of the kidney. As has been mentioned before, the functions of the kidney are to maintain an equable concentration of water and inorganic materials in the body and to dispose of waste or useless substances. In that phase

of nephritis intervening between the acute and chronic form the concentrating or diluting power for water and salts is most severely injured, while the ability to excrete nitrogen is little affected. The principle of rest is the most important in our therapeutic armamentarium. In this phase of nephritis fluids and salts should be restricted in accordance with the needs of the case. Bearing in mind, however, that the kidney is a damaged organ, there is no object to be gained in prescribing an excess of protein in the diet. Most people eat too liberally of protein and it entails no hardships if this amount is reduced to 60 to 80 grams per day—about two-thirds of the ordinary person's intake. Here we may take a moment to dispose of the ancient bogey, the fear of meat protein. There is nothing in it. Indeed, on the contrary, those cases of nephritis with the ability to dispose of the waste products of protein metabolism do far better on red meats than if placed on the markedly restricted protein allowances which induce dissatisfaction with the diet and, what is more important, the anæmia erroneously supposed to be inseparable from long-standing nephritis. For provision of the remaining calories a generous mixture of fats and carbohydrates containing an adequate amount of roughage is desirable for these patients. Milk in itself is not particularly desirable, except as a constituent of made dishes. Soups, except milk or cream soups, should be avoided as supplying unnecessary work to the kidney by reason of their fluid and salt content. As it is not improbable that the efficiency of the kidney will change from time to time, function tests, such as the water test and concentration test of Volhard and Fahr, together with the clinical history and physical examination, provide the necessary evidence for making such alterations as will keep the work required of the kidney within its capacity. A small proportion of these subchronic cases on developing an acute exacerbation acquire a massive oedema. As in the acute nephritic, a few days' restriction of all fluids and solids, giving the patient only small quantities of ice to suck to alleviate the thirst, may sometimes be productive of remarkable results. The subchronic nephritics should in no wise be neglected because they appear to be doing fairly well.

With care they present a prognosis of many years of usefulness.

The measure of a kidney's efficiency is its ability to vary its output in accordance with the intake. When variability of function is lost there ensues the end stage of the disease, whose duration may be brief or very considerable. Not only nycturia, but also polyuria, has developed by this time, and though the kidney may be able to carry on with the aid of raised blood pressure and polyuria it can readily be seen that the situation is somewhat precarious. It is for this reason that we lose so many of these patients by a very minor acute exacerbation which decreases the polyuria, thus limiting the excretion of nitrogenous substances, whereupon true uræmia ensues. The same general protective measures advised in the subchronic phase are applicable here with even more force. Focal infections must be treated and acute respiratory infections guarded against. Rest to the kidney is still a prime principle in treatment but here the ability to handle protein is reduced and a corresponding reduction in protein intake must be made and we are guided in this by watching the fluctuation of the non-protein nitrogen of the blood under varying amounts of protein intake. The patient with marked renal insufficiency cannot afford to waste his ability to handle protein. He should, therefore, eat such proteins as most effectually replace his body protein. Small amounts of meat, eggs, fish, fowl and milk products do this with less wastage than other proteins.* The remainder of the caloric requirement is made up with carbohydrate and fat. Water should be allowed liberally since these patients have an obligatory polyuria, but the mineral salts should not be excessive in amount. A morning saline is desirable in most cases, and symptomatic treatment, as needed for cardiac weakness, headache, sleeplessness, etc. The time-honoured use of diuretics and of hot packs plays no part in the treatment of nephritis today. Indeed it is now recognized that the diuretic, while of considerable value in removing cedemas of cardiac origin, is of no value and of considerable injury to the patient whose kidney is inflamed. The hot pack, while of use

as a sedative, has no particular value in nephritis, is much too enervating, and may even be the source of a cardiac collapse.

The previous speaker has described two sorts of uræmia, the eclamptiform without nitrogen retention, and the true uræmia with nitrogen retention. The prognosis in the two is quite different. The eclamptiform, or convulsive type, which probably depends on a misplacement of water in the nervous system, is alarming but usually has a good prognosis. Many lines of treatment have been advocated, but probably the simpler are the better. Protect the patient from injury to his body, especially the tongue; control the convulsions with chloroform; inject one-third to one-half grain of morphine and allow twenty minutes for it to act, discontinuing the chloroform as the effect of the morphine comes on; and then give drastic purgation. Two to three minims of croton oil in 1 drachm of paraffin oil may be given on the back of the tongue or by stomach tube, and followed by an ounce of saturated magnesium sulphate solution every two hours if necessary.

In true uræmia with nitrogen retention the prognosis is much more grave. Three common types appear. The first is those in which excessive intake is responsible; if not too far advanced, these cure themselves by the anorexia and vomiting induced by the retention products, but this process can be accelerated by liberal administration of glucose intravenously, amounts of 3000 to 4000 c.c. daily being not unusual. The second type is dependent upon an acute exacerbation developing in a kidney with a subchronic or chronic lesion of moderate severity and producing anuria or oliguria. These patients should be tided along, hoping for the acute injury to subside sufficiently to permit recovery of adequate function. Rest, foods high in carbohydrate, with liberal fluids, if necessary given intravenously, and a brisk purge are desirable. In the third type, with gradually developing signs of uræmia, even on a diet low in protein, little of value can be done. Dyspnoea due to an acidosis can be relieved by liberal administration of sodium citrate and sodium bicarbonate, and the dehydration relieved by intravenous glucose solution if necessary, but aside from making the patient more comfortable treatment is of little avail.

* Fat bacon, meat patties, omelettes and Irish stew make a considerable show without using any great portion of the protein allowance.

SUMMARY

In summary then, three phases of the progressive disease nephritis are discussed.

The first is a subacute phase, in which the patient has never become free of clinical symptoms of nephritis since his acute attack.

The second is a subchronic phase in which the patient feels well between exacerbations; his urine, however, is never free of albumen and casts and his functional efficiency grades from excellent down towards the stage of fix-

ation of volume and specific gravity. In this phase nycturia, with some rise in blood pressure, and slight cardiac hypertrophy gradually develop and are the outstanding signs of relative inefficiency.

In the third phase functional kidney inefficiency is accompanied by polyuria, a raised blood pressure, well marked cardiac hypertrophy and retinitis, and ultimately leads to a nitrogen retention and uræmia.

SUBACUTE AND CHRONIC NEPHRITIS*

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IN this symposium on subacute and chronic nephritis there are certain points of real significance to us as clinicians engaged in the diagnosis, prognosis and treatment of nephritis. In the first place, it is fundamental to our understanding of subacute and chronic nephritis to realize that it is the result of a diffuse inflammatory lesion in the kidney which is progressive in nature. In all cases of subacute nephritis and in many cases of chronic nephritis this inflammatory lesion has its beginning in a definite attack of acute diffuse glomerulonephritis. Although the majority of cases of acute nephritis make a complete recovery, in some the symptoms of renal disease persist, the patient dying in a few months to a year or more of subacute nephritis. In others there is apparent recovery, but after varying periods of time, often many years, symptoms and signs of renal insufficiency develop and the patient dies in the end stage of chronic nephritis. This does not constitute the whole group of chronic nephritides, however, for in a certain percentage of cases no definite history of a previous acute attack is present. Yet, the final clinical and pathological findings are similar, if not identical, in both groups. The process in the latter group is insidious in its development but nevertheless slowly progressive. It is important to remember too that cases of chronic nephritis may have acute exacerbations,

that is, attacks of acute nephritis on top of a chronic lesion, and that the final illness may be ushered in by an acute attack, the patient dying in a few days of uræmia. In these acute exacerbations of chronic nephritis the clinical symptoms and signs and the urinary findings may simulate those in a primary attack of acute nephritis, yet the prognosis is quite different than in primary attacks of acute nephritis, being affected by the stage of the chronic nephritis present.

In discussing the pathology of the kidney in subacute and chronic nephritis it was pointed out that the chief lesion is most generally present in the glomerulus, but that the interstitial tissue and the smaller arteries are also involved in the inflammatory reaction, and that the degree of involvement of these three structures—glomerulus, interstitial tissue, and arteries—is seldom uniform. Although the interstitial tissue of the kidney in certain cases may show more severe structural change than the glomerulus, symptoms of chronic nephritis only become manifest when the glomeruli are affected to a degree to encroach upon the functional reserve of the kidney. Special mention, however, must be made of cases in which the vascular changes in the arterioles are the dominant kidney lesion. These belong to the group with persistent hypertension. The presence of hypertension is an indication of vascular changes in the smaller arteries all over the body, particularly in the kidney, heart, brain and retina. When these have advanced to a

* A paper opening the discussion on Subacute and Chronic Nephritis at the annual meeting of the Ontario Medical Association, Kingston, May-June, 1928.

certain stage the resultant symptoms may be renal, cardiac, or cerebral in origin, more often a combination of two or all three. This fact is often not fully appreciated, more particularly in the treatment of cases of hypertension with oedema. In the presence of hypertension a history of nycturia or cerebral symptoms, the presence of albuminuria, cardiac hypertrophy, with or without signs of failure, and retinal changes, are important in determining the organ or organs chiefly affected by the vascular changes present.

Reference has been made to the frequency of a history of an upper respiratory tract infection preceding an attack of acute nephritis, and to the effect of intercurrent infection on the clinical course of acute, subacute and chronic nephritis. There are two diseases in which there can be no doubt of the deleterious effect of an intercurrent or co-existent infection on their clinical courses. I refer to diabetes mellitus and nephritis. Disregard of an infection of the upper respiratory tract in cases of acute nephritis is no doubt responsible for certain cases dying in the acute or subacute stage of the disease. The frequency of upper respiratory tract infections preceding an attack of acute nephritis, the prolonged and stormy course of cases of nephritis with a co-existing infection, the exacerbation of symptoms associated with the development of a new infection, and the marked improvement following the subsidence or removal of foci of infection, if not proof, are at least very suggestive evidence of the etiological relationship of infection in the upper respiratory tract to the development of diffuse nephritis. In the prevention and treatment of nephritis the importance of infection in the upper respiratory tract cannot be overestimated.

Although the importance of infection in the development and affecting the progress of lesions of the kidney in nephritis has been stressed, other factors such as exposure to cold, fatigue, unbalanced diets, etc., must not be forgotten. These probably act as contributing factors by

lowering the resistance of different regions of the body, making them more susceptible to the effects of infection.

The urinary symptoms and the blood findings in subacute and chronic nephritis result from the decrease in the capacity of the kidney to regulate the water and salt content and the reaction of the blood and to excrete nitrogenous waste products. This is interfered with chiefly as a result of the lesions in the glomeruli. With a progressive process often extending over years, as in chronic nephritis, it is important to detect the earliest signs of renal insufficiency. A clinical finding suggestive of renal disease is albuminuria, with or without red blood cells. Hypertension is an indication of generalized vascular disease which may affect the function of the kidney. A history of nycturia is very suggestive of renal insufficiency. The presence of any one or all of these findings should lead to a careful investigation of the function of the kidney. It has been pointed out that the normal kidney has the capacity of secreting urine of varying concentration. With progressive disease of the kidney this function is interfered with. Hence the importance of testing the amount and specific gravity of the different samples of urine passed during the twenty-four hours.

Oedema is an important objective symptom of both renal and cardiac insufficiency. In treatment it is important to determine the origin of the oedema. Mistakes are often made, particularly in cases of hypertension with oedema, for if passive congestion is present the urine may show albumen and even red blood cells, suggesting renal disease as the cause of oedema, and as a result the case is treated as one of renal rather than cardiac oedema.

Little more need be said with reference to treatment except to again call attention to the importance of a co-existing infection in affecting the clinical course of nephritis, and to the necessity of eradicating all foci of infection and protecting the patient with nephritis as much as possible from intercurrent infections.

CARBON MONOXIDE.—We learn from *Industrial and Engineering Chemistry* that the U. S. Bureau of Mines, Pittsburgh, Pa., has recently completed a one-reel educational motion picture film, entitled "Carbon Monoxide: The Unseen Danger." This film, prepared in co-operation with a large automobile manufacturing company,

shows how this deadly gas may be encountered in workshop, garage and home, points out ways of preventing accumulations of the gas and visualizes methods of reviving its victims. Schools, churches, etc., may use the film free of charge, by paying transportation costs. —*Science*, 68: Aug. 31, 1928.

DIATHERMY

A CRITIQUE AND AN EXPERIMENTAL STUDY*

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CONCERNING diathermy, which has now come of age, two fundamental misconceptions are still widespread in medical circles. As they are quite contradictory they should logically destroy each other, but they do not. Instead, they hinder the progress of medicine.

Why? Because they both have become what Francis Bacon called "idols of the cave," each with its particular group of adorers. When a physicist of some renown points out that diathermy cannot heat body tissues to any depth because it has been shown by Thomson that rapidly alternating currents tend to run along the surface of metallic conductors, why should not Dr. Routine rejoice and repeat the statement on every possible occasion? All unconsciously he is defending his tottering god, Cataplasma, with the energy of an old Roman trying to stem the rising tide of Christianity.

Again, when Professor Bouasse² of the Faculty of Sciences of Toulouse (France), in a highly technical work on "Electrical Oscillations" finds space to ridicule those who persist in using d'Arsonval currents "to draw dollars from the patient's purse while they draw sparks from his nose," we need not be surprised if Dr. Snobb snickers aloud. Snobb has always taught that electrotherapy is nothing more than the modern reincarnation of eternal quackery. Small wonder, then, if William Vignal,³ in a recently published handbook on medical electricity, feels himself obliged to denounce in scathing terms the writing-desk type of physicist who is content to juggle with mathematical deductions, draws his electromedical lore from musty catalogues and, all told, reveals himself afflicted with the peculiar disease psychiatrists call "negativism." It is hard to say what havoc negativism may be playing in France, the land of Dr. Vignal; but here in America there is rather a

general tendency towards a state of mind which might be dubbed "assertivism."

This brings us to consider another basic misconception concerning diathermy. It is propagated by our good friend Jim Vendor, who willingly assumes the task of instructor in up-to-date medicine wherever adequate post-graduate instruction is lacking. Leave your prescription pad within his reach and Jim will prove to you, by means of a very simple diagram, that the maximum heating effect of the diathermic current is to be found halfway between the two electrodes if they happen to be of equal size and symmetrically disposed. He draws another sketch figuring electrodes of unequal size and again traces his fatidical X to show where the maximum heat is located this time. The inference is obvious: you can generate heat at any predetermined depth and in any desired quantity. It is all a question of electrodes and milliamperes. Jim, we all know, gets his physics from Hyfreaks, the "boss." But where does Hyfreaks get his? In perfect good faith he generally takes it out of some respectable text-book on physiotherapy. The authors of such works are naturally quite elated when the empirical use of a new "modality" is found to be justified by the known facts or accredited theories of positive science. When certain carefully conducted experiments established beyond cavil that diathermy is at least worthy of its name and quite capable of "heating through," our authors added the details of such experiments to the theoretical chapters of their books and pointed to them with pardonable pride.

So far, so good. Unfortunately, other laboratory experiments seemed to show that a high frequency current when properly handled could liberate a maximum of heat in the very centre of an object under test. This also was accepted, as if it bore the hall-mark of a truly crucial demonstration, and it eventually served as a basis for the pernicious fallacy we might call "the

* NOTE: First public demonstration at the University of Montreal on November 15, 1928; first report published in *L'Union Médicale*, Dec., 1928.¹

dogma of central fire." In short, to-day diathermy stands vindicated but it is not yet sufficiently "debunked." The time has come to submit all *in vitro* experiments to the most acid criticism in order to determine exactly what they prove.

Pre-eminent among the classical experiments are those of Bordier,⁴ because they are simple, elegant and convincing. It is doubtful, however, whether their originator, who is a very cautious man, content with describing what he sees, ever dreamt that they would serve as a pretext for a most sweeping generalization.

Says Bordier: "Let us pour some white of egg into a flat glass dish or other non-conducting vessel. Let us dispose two straight metallic plates at opposite extremities and pass a diathermy current, very weak at the start and increasing very gradually. After a while we will see a clot appear in the centre of the vessel, at equal distances from either electrodes. It slowly spreads from the centre towards the electrodes. On the other hand, if we use a stronger current and make no attempt at a gradual increase we will see clots form near the electrodes and not at the centre." (For convenience these experiments will be designated henceforth by the letters A and B).

Exactly what and how much do "A" and "B" prove? At first sight it would seem that using the technique recommended for so-called "medical" diathermy, we can obtain the maximum heating effect half-way between the electrodes. (That is: in the very depths of our patients, if we are inclined to reason by homology). On second thought, however, doubt arises. True, A and B call for different time and intensity factors, but all other factors remain the same. With no change in the nature, quantity and disposition of the fluid, with no change in the frequency of the current, is it not surprising that "A" and "B" should give diametrically opposite results? Is it not possible that some disturbing element steps in from without in the course of one experiment or the other? If so, considering that "B" is always successful and "A" very seldom indeed, must we not suspect A? Can it be that dissipation of heat from the walls of the vessel and from the electrodes combine with convection currents in the final mass to make "A" fallacious and misleading?

Doubts remained unuttered until two Ameri-

can observers, Bettman and Crohn,⁵ decided to repeat the Bordier experiments with certain refinements of technique. A solid mixture of agar-agar and albumen was substituted for the liquid white of egg, apparently for reasons of convenience and not to eliminate the possible errors of the Bordier experiment. In no case did Bettman and Crohn ever produce a central clot except when the electrical field was wilfully disturbed by the introduction of air-bubbles, pieces of bone or other resistant objects. The same paper, published early in 1927, reports other experiments and give conclusions which have rightly been challenged by Binger and Christie,⁶ but we need not consider them here. Sufficient to say that the experiments conducted with egg-agar remain undisputed.

But they might well have been criticized on purely theoretical grounds. Presumably, coagulated parts no longer have the electrical constants of their undisturbed surroundings; they may become heat centres because of their greater resistance or capacity. It cannot confidently be affirmed that the figures obtained are true delineations of what would have happened in the mass if it could have remained homogeneous. Judged from a practical point of view the images are very crude, they do not allow exact measurements, they give poor photographs, and the agar mass can serve only once. Nevertheless, Bettman and Crohn's experiments marked a distinct advance.

Early in 1928 it occurred to me that a better medium could be obtained by using one of the so-called thermoscopic substances instead of albumen. These curious compounds change colour when they are heated and return to normal when cooled. The change seems to be purely physical and is not accompanied by any important variation of the electrical constants. To be applicable, any such substance would have to fulfill the following requirements: the colour change must occur at temperatures approximating those utilized in non-destructive diathermy, if possible below 45° centigrade or, at any rate, below the melting-point of the menstruum. It was surmised that the colour change might be rather faint under normal working conditions, so that it might be necessary to intensify it by means of filters, in order to allow proper visualization and photography. Six months of research can be summed up as follows and the results

obtained are sufficiently demonstrated by the plates annexed to this article.

THE HEAT-SENSITIVE SUBSTANCE

We use tetraiodomercuriate of silver extemporaneously prepared according to a formula which will be published elsewhere. It is canary-yellow when cold and orange-red when hot. Samples can be obtained of such exquisite sensitiveness that they are yellow at body-heat and orange at fever-heat. Such a substance is eminently suitable for the purpose.

THE DIATHERMOSCOPIC MEDIUM

Gelatin is out of the question on account of its low melting-point. Pectin, silica and other jellies are not practical because they are mechanically weak. Agar-agar is quite good when used in proportions varying from 2 to 3 per cent. The silver salt is mixed with the agar at the very beginning in order to approximate as much as possible a photographic emulsion. When cool the mass resembles custard. If heating is continued until the temperature has fallen below the setting-point of the agar, a thick cream resembling mayonnaise is obtained. The cream is

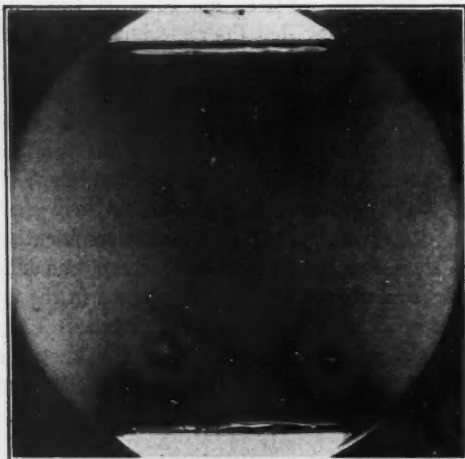


FIG. 1

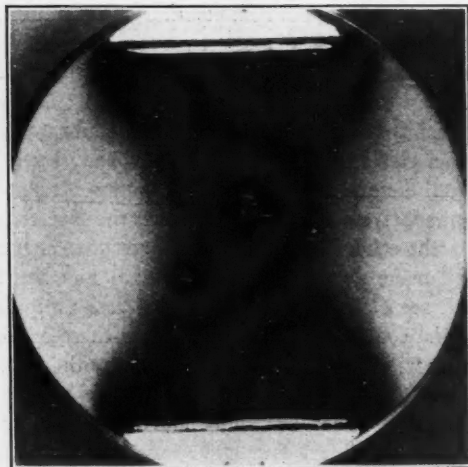


FIG. 2

Two parallel plates in a round dish, as in experiment A of Bordier. Heating always starts near the plates and at their edges (see 1). It spreads to the centre, giving the appearances of Fig. 2 (these and all other cuts are made from unretouched negatives).

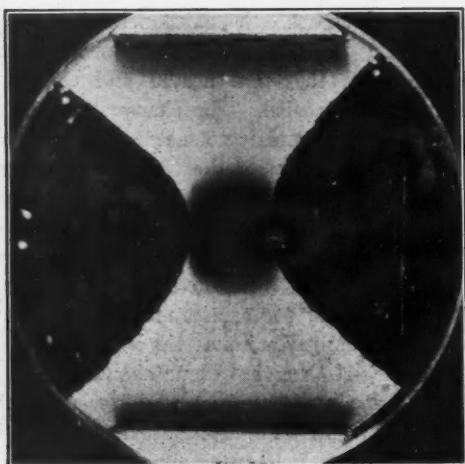


FIG. 3

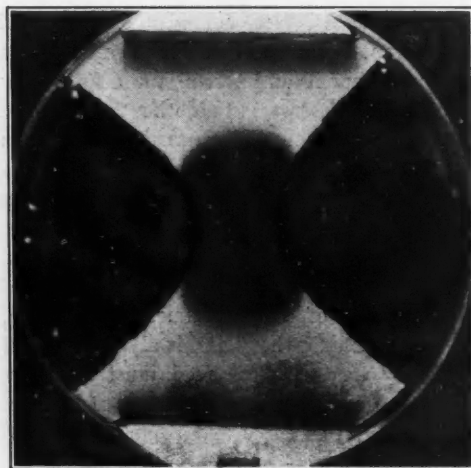


FIG. 4

A piece of jelly has been cut away, as shown. Heating starts in the centre and spreads towards the plates. No hot points near plates. (Disregard the rectangular shadows in the vicinity of both plates).

much more convenient to use than the jelly but, of course, the jelly is indispensable where depth effects are to be studied. Both products are easily prepared, cost about a dollar a quart, and can be used over and over again.

THE ELECTROLYTE

Plain water, agar, and an insoluble precipitate make up a mass of very poor conductivity when compared to that of the human body. To lower the resistance we have used varying proportions

of potassium nitrate instead of sodium chloride. This, in order to avoid corroding the electrodes.

THE ELECTRODES

For experiments of short duration any metal will do, but it must be remembered that very few may be left in contact with a mercury-silver salt. Carbon is unworkable; platinum is too costly; iron is perishable; copper, silver, tin, lead and aluminum decompose and desensitize the heat indicator. Nickel is perfect but hard to find. The nickel alloy commercially known as

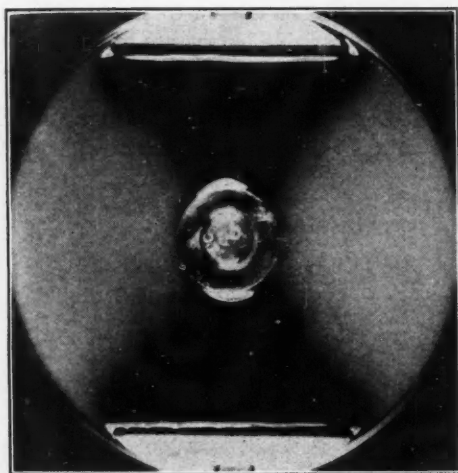


FIG. 5

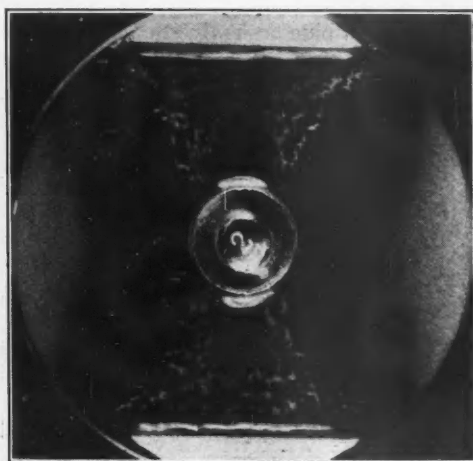


FIG. 6

A good conductor is immersed in creamy emulsion half-way between the electrodes. Hot spots first appear on either side of the metal, along the interpolar line; none on the plates. Soon we have the figure shown in 5. After a while the heat spreads as in 6, but the original triangles still remain hotter than their surroundings. This is manifested by the appearance of bubbles.

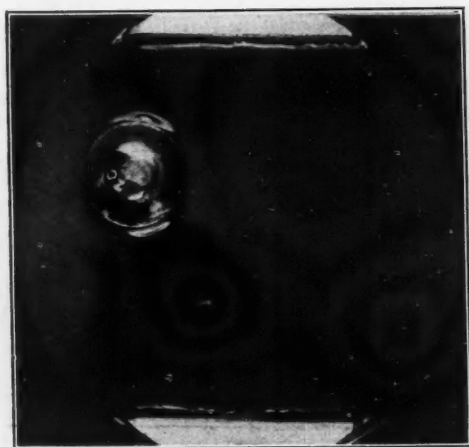


FIG. 7

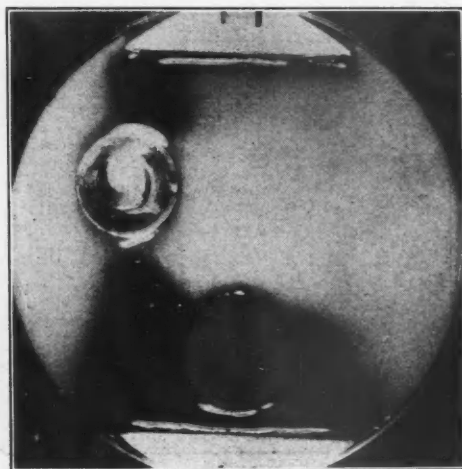


FIG. 8

A good conductor placed asymmetrically. The electrical field is distorted and the diathermy image also. Note the hot spot at right edge of the upper plate. If a non-conducting obstacle is added, near the middle of the lower plate, the hot spot no longer appears on the upper plate.

"Monell metal" is recommended. The solid mass may be cut through with a "stainless" steel knife.

THE COLOUR FILTERS

As a rule the change in colour will be plainly visible to the unaided eye, but the use of special contrast-filters is strongly recommended. Yellow-green is the point of highest visibility in the spectrum and it also happens to be the colour of our medium when cold. A visual filter should respect this background while the hot parts are made to appear black or, better still, deep red. Bromophenol blue is the dyestuff recommended, with indigo carmine as second choice. For photo-

graphy, slow orthochromatic plates are best, (not panchromatic). Brilliant green gives a very efficient photographic filter. To avoid surface reflections and the diffuse blue opalescence coming from the agar, pure yellow films are bound up with both the visual and the photographic filters.

THE HIGH FREQUENCY GENERATOR

Any diathermy instrument will do for investigating within the range of present medical practice. We used for our own experiments a machine with the following characteristics: fixed primary voltage on the low-frequency side; fixed spark gap; variable inductance on the high-frequency side. Frequencies ranged from 500,000

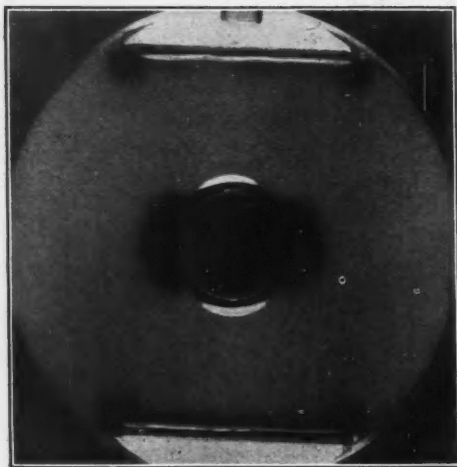


FIG. 9

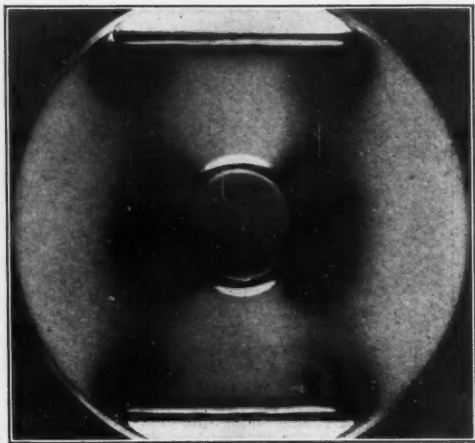


FIG. 10

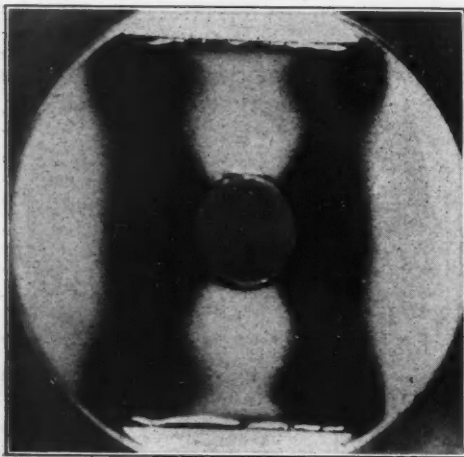


FIG. 11

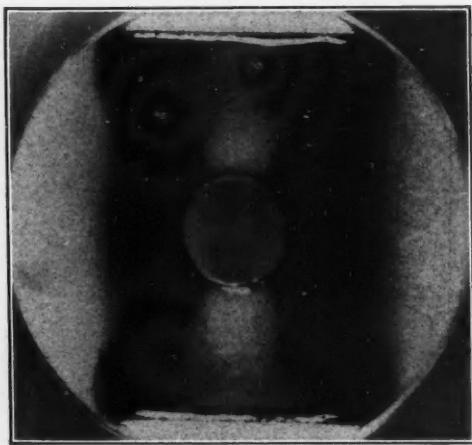


FIG. 12

High resistance in the centre of the dish. Note six hot spots in Fig. 9. In Fig. 10 it is hinted that they will join, three by three, along the shortest path. Fig. 11 shows the completed figure. Fig. 12 shows the heat creeping in between the ebonite cylinder and the plates. (Note.—White lines running parallel to plates or knobs in these and preceding figures are due to reflections).

to 2,000,000. Time, voltage, and current density factors were widely variable.

COMMENTS

Before offering his conclusions the author wishes to add a few remarks in commendation of his method and also in criticism. He is quite aware that thermoscopic substances present great possibilities for the study of whatever heating effects may be produced by the passage of electric currents through fluid or pasty electrolytes and dielectrics. Some vexed problem of engineering may possibly be solved by working along these lines. No method can show up so well the intricacies of normal or distorted electrical fields. The college demonstrator is now in possession of a class experiment equalling in beauty the widely-used method of delineating magnetic fields by means of filings. It should eventually find its way into many a text-book of physics and of electrotherapeutics.

Physicians will want to experiment with the agar and it is suggested that manufacturers of electromedical apparatus provide a simple kit containing flat and curved electrodes, Petri and other dishes, etc. We venture to predict that many a practitioner will strive to improve his technique when he has found with his own eyes that high frequency spells high-freaks if the electrodes are in poor contact, asymmetrically disposed, or not proportioned to the part under treatment. Some experiments in progress suggest the possibility of minimizing "edge-effect" by the use of properly fenestrated electrodes.

One must bear in mind two fundamental shortcomings of the method. These are experiments *in vitro*! Analogies between pieces of metal and main blood-vessels, or between hard rubber cylinders and bones are useful only as an incentive to further experimenting, clinical or otherwise. The researches of Binger and Christie show conclusively what a preponderant part the blood stream plays in carrying away calories as fast as they are generated.

The reader is also reminded of the fact that silver tetraiodomercurate passes very quickly from yellow to orange, and from orange to red, if the temperature is raised above the critical point. All further heating fails to accentuate the blush. Thus a uniformly coloured field, whether yellow or red, does not indicate a uniformly heated field. However, if the develop-

ment of the heat spots is carefully followed, a very fair idea can be had of the relative heat gradients when the experiment is brought to a close. Those parts that were first to blush remain the hottest. This assumption has been repeatedly confirmed by measurements made with a thermoelectric needle.

CONCLUSIONS

Our experiments were conducted with electrodes of different sizes and shapes, in shallow dishes of the emulsion or on large blocks of the jelly, at several frequencies, with widely variable time, intensity and ohmic resistance factors. Attempts were made to mimic body conditions by working on "layer-cakes" composed of wet chamois leather, petrol-agar emulsion, and water-agar. It soon became evident that all this constituted a very crude approximation because it disregarded one great factor of heat distribution ever present during therapeutic applications, namely, the blood stream. On that account, the possibility of establishing an artificial circulatory system by means of saline solution passed through coils of macaroni was investigated with encouraging results.

It is quite evident that such experiments had better be reported in periodicals dedicated to physiotherapy or biophysics. However, those who have waded through our article in the hope of discovering some useful truth will expect a few general conclusions concerning the value and shortcomings of diathermy. The following are offered:

1. "Diathermy" is not a misnomer. Currents of the frequency used in medical practice do not flow over the surface of colloid-saline masses; they go right through, and they are capable of heating all through.

2. The path followed by such high frequency currents is very similar to that which would be followed by unidirectional or low-frequency currents.

3. "Skin effect" need not be a bugbear or a deterrent. Experiments made with hollowed-out bologna sausages or cylinders of salt solution may tend to show that skin-effect is quite noticeable during diathermy, but such experiments are fallacious because they are based on meter readings and because the test object is altered in the course of the experiment. When the test-object is left untouched and the doings of the current

judged by the appearance and distribution of heat, skin effect seems a negligible factor.

4. Superficial hot-spots and "edge-effects" are manifestations of an uneven electrical field rather than of poor contact or sharp edges. More attention should be paid to the relative size and position of the plates in each particular instance.

5. "Maximum heat at the centre" is a misleading slogan. In a homogeneous, unobstructed and unconstricted electrical field the greatest heating effect is always to be found near the electrodes and not half-way between them.

6. Internal hot-spots or islands are, however, theoretically possible in certain cases, for instance, when a bone or an intestinal loop filled with gas occupies a relatively large portion of the diathermic field.

7. The blood stream tends to nullify the deeper local effects of diathermic currents, but the interaction of both superficial and deep circulation with the heat regulating centres of the body could easily reverse the heat gradient observed in some of our experiments. When and within what time this occurs is a question that cannot be solved by "in-vitro" investigators.

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THE PREVENTION OF GALL-STONES

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Toronto

THE knowledge of the method of formation of gall-stones has not helped to improve our diagnosis or to advance our treatment to a very appreciable extent up to the present time. If the theory that stones result from a chronic inflammatory process due to infection in the gall-bladder is accepted, has this knowledge enabled us to prevent the occurrence of such infection? If the theory that the cholesterol, which constitutes the greater part of most gall-stones, comes from the wall of the gall-bladder or from the bile itself by some process of precipitation or concentration, at a time when the bile contains an excess of cholesterol, or when the blood is high in cholesterol content, has this knowledge assisted us in reducing this excess in the bile or blood? If stasis of the bile in the gall-bladder plays a part in gall-stone formation and has something to do with the presence of bile-pigment salts in gall-stones, are we taking cognizance of this fact and doing anything to prevent the occurrence of such stasis?

From a study (a) of the pathological histology of a considerable number of gall-bladders removed at operation; (b) of the laminated structure of cross sections of a series of gall-stones;

and (c) of the recent knowledge of the blood chemistry of cholesterol and the occurrence of hypercholesterolemia, certain hypotheses may be developed whereby such knowledge may prove of value in enabling us to determine the conditions under which the formation of gall-stones is probable and in indicating the general principles along which treatment may be applied to remove or alter such condition in such a manner as to render this formation less likely.

THE PATHOLOGY OF THE GALL-BLADDER

The variation in the degree of pathological change in the gall-bladder ranges from a minimal amount, with practically no alteration in the mucous membrane, no thickening in the submucous, muscular or peritoneal coats, no increase or decrease in the size of its contained cavity, to almost a maximal amount, as shown by destructive changes in the mucous membrane, marked fibrosis and thickening of all the coats, and by dilatation to many times its normal size or contraction down to a minute sac.

In the gall-bladders showing advanced changes it is impossible to determine how much of this alteration has occurred before and how much after the contained stones were formed. Those

with a small amount of change in the wall are divisible into two groups; (a) those showing considerable change in the wall, indicating that chronic infection had unquestionably played a considerable part in this change; and (b) those showing little or no change in the wall, suggesting that if infection had been present it had died out before any appreciable change had occurred in the wall. In this latter group, the gall-bladder may be partially or completely filled with stones, and it seems reasonable to assume that the chief factor in the formation of the stones in these cases has been a biochemical one rather than an infection. (For a consideration of the bacteriology of the bile see Hansen¹).

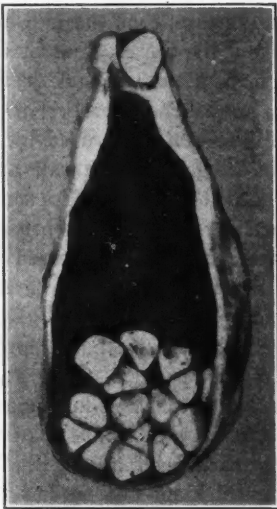


FIG. 1.—Gall-bladder, showing evidences of chronic inflammation from infection. The mucous membrane has been destroyed; all the coats of the wall show marked fibrosis and thickening; the cavity is increased to four times the normal size; numerous faceted gall-stones are present, one of which has acted as a ball-valve at the outlet of the cystic duct.

THE STRUCTURE OF GALL-STONES

Cross sections of gall-stones show them to be formed of a series of laminated layers of various salts, the chief of which are cholesterol, bile-pigment salts and calcium, and a frame-work or cement of some albuminous material. In most stones, the central area is dark in colour, due to the presence of bile-pigment. Surrounding this a whitish crystalline zone is seen, varying in thickness from that of a sheet of paper up to one-third or one-half inch, due to the presence of almost pure cholesterol. This is again surrounded by alternating layers of varying thick-

ness and amounts of either bile-pigment salts or cholesterol, or a combination of them. In some stones, bile-pigment predominates, in others, cholesterol. In one group the outer covering of the stone is free from bile-pigment, but has not the white crystalline appearance of pure cholesterol; it is found to consist mostly of

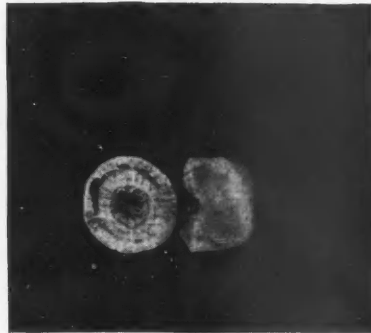


FIG. 2.—Gall-stone, showing (1) the pigmented centre; (2) a zone of cholesterol one-third inch thick with no bile pigment; (3) a thin zone of bilirubin calcium; (4) an outer zone consisting chiefly of calcium.



FIG. 3.—Gall-stone, showing: (1) the pigmented centre; (2) a zone of cholesterol; (3) a thick zone of bilirubin calcium; (4) an outer zone of calcium with some pigment.

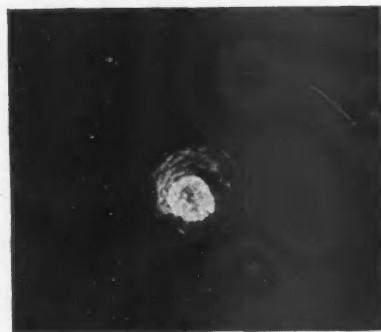


FIG. 4.—Gall-stone, showing: (1) the small pigment centre; (2) a zone of pure cholesterol; (3) numerous layers of bilirubin calcium.

calcium, a fact which is of value in explaining the characteristic radiographic shadow of gall-stones with its dense margin and pale centre. The absence of bile-pigment in this outer zone would indicate that no bile has been entering the gall-bladder during the deposition of this layer, a fact which has often been confirmed at operation and found to be due to a blocking of the cystic duct, either by a stone or inflammatory changes.

In endeavouring to explain this laminated character of gall-stones, with the deposition at one time of cholesterol, at another of bile-pigment salts, and at a third of calcium with some cholesterol but no bile-pigment, the question arises as to whether any change has taken place in the life-history of the individual which might explain these various laminae. Many stones with a central area of pigment have been found to contain organisms, thus proving fairly conclusively that these organisms have been an active factor in causing the stones. At times, it is possible to obtain a history of the particular infection, such as of typhoid fever some years before, but, as a rule, it is difficult to obtain a clear history of the particular illness from which it can be said the gall-bladder became infected. The reason for this seems to be, in the first place, that the original attack of cholecystitis took place at an age between twenty to forty years of age, a period during which the recognized text-books speak of this disease as a rare and unusual occurrence. The average practitioner of the past generation only expected to see cholecystitis after the patient had reached the age of forty-five or fifty, and consequently, when a patient of twenty-five or thirty suffered from a mild acute attack with some epigastric pain, possibly some nausea or even vomiting, and some soreness in the epigastrium or under the right costal margin, this was usually diagnosed as "acute indigestion" or "a bilious attack" without his even taking the trouble to make an abdominal examination. Had such an examination been carried out there would probably have been elicited the presence of some rigidity of the upper right rectus muscle with localized tenderness over the gall-bladder.

From the standpoint of treatment, the practitioners' results in such cases were perfectly satisfactory, for the free purge and the restricted diet relieved the patient of his or her symptoms,

without his realizing that the mildly infected gall-bladder was at the same time undergoing resolution. In the past, many cases of cholecystitis have unquestionably been overlooked in some such manner as that above described, and they will continue to be overlooked in the future if patients are not subjected to careful abdominal examination when this condition is suspected.

The relation of this original attack to the composition of the bile and blood, especially as to the amount of cholesterol which these body fluids may contain, will be further discussed under the next heading. An explanation for the large zone of cholesterol surrounding the central pigmented area is difficult, if the theory is accepted that all the cholesterol comes from the mucous membrane of the gall-bladder wall and none from the increased amount known to be present in both the bile and the blood. The presence of pure cholesterol stones, with no evidence of infection, as proved by culture, or of change in the gall-bladder wall, as proved by section, is hard to explain unless some relationship is considered to exist between hypercholesterolaemia with an increased amount of cholesterol in the bile and the finding of this salt in the form of a stone in the gall-bladder.

The fact that these chemical substances are laid down in strata in gall-stones strongly suggests that some disturbance has occurred in the gall-bladder, or in the chemistry of the bile, at the time that each layer is laid down, and that a period in which no deposit has taken place has alternated with these times of activity. Whether there is a combination of infection and biochemical change going on at the same time, in which at one time the infection is the dominating factor and at another time, the biochemical change, seems to be worth consideration. The fact that such is probable is borne out by the variation in the histological changes found in the gall-bladder walls as described above, and by the alternation of the layers found on the section of gall-stones. A study of the clinical side of many of these cases also seems to bear out this idea.

In one group of cases, the patient suffers from the typical symptoms of an acute cholecystitis, coming on with an attack of nausea or vomiting, malaise, and a feeling of depression, a slight rise in pulse and temperature, and a mild leucocytosis of 12,000 to 15,000. On examining the ab-

domen, localized tenderness and rigidity are found in the right upper abdomen. The attack may only last for twenty-four or forty-eight hours, or continue for as long as a week, following which the patient is perfectly well. In such cases infection is almost unquestionably the cause of the pathological changes producing the symptoms.

During the existence of attacks, such as the above, stasis of the bile in the gall-bladder probably occurs. The retained bile, along with the inflammatory exudate, may give rise to such a degree of tension within the gall-bladder that the amount of pain from which the patient is suffering is out of all proportion to the degree of inflammatory change in the gall-bladder wall. Under such conditions, the rapid cessation of pain would be an indication of the relief of tension by the re-opening of the cystic duct. While the bile is retained, it may become more highly concentrated and thus cause the precipitation of some of its salts, thereby forming nuclei for future gall-stones or a new layer on those already present. The repetition of attacks similar to the above, which is so common in these cases, with a fresh precipitation during each exacerbation, would explain the laminated character of gall-stones.

After stones are formed, it is easy to understand the part they play in obstructing the cystic duct and producing typical attacks of biliary colic. Under such conditions the usual cause to which the pain is attributed is the presence of spasm in the cystic duct. That such may and does occur would be hard to refute, but that there is something more than spasm is suggested by the fact that no relief from the symptoms occurs even when large doses of atropine are given. The enormously increased size of many gall-bladders in which stones at times are found at the orifice of the cystic duct can only have come about by the repeated occurrence of increased tension within its cavity, and it seems reasonable to assume that, if tension has been of sufficient degree to cause such dilatation, this increased tension is at times the cause of pain, just as similar distension in any part of the alimentary tract causes pain. At times the tense and distended gall-bladder can be palpated during an attack, but immediately disappears when the attack has passed off. The explanation of the pain in attacks of biliary

colic by increased intra-vesicular pressure seems to me a much more reasonable one than by spasm of the small amount of muscle in the wall of the cystic duct.

Up to the present time no satisfying logical explanation of the symptoms characteristic of cholecystitis has been forthcoming. That the pathological changes in the gall-bladder set up certain nervous impulses which ultimately reach the stomach through some reflex arc, and thereby produce a feeling of fulness and distress in the epigastrium, is a good working hypothesis, but why it does so is at present beyond scientific confirmation. In some cases, gas distends the stomach and this origin can be seen on inspecting the abdomen; in others, aerophagy is undoubtedly the cause of the gas. The source of the gas in the former cases is considered to be the blood, CO_2 being given off from the mucous membrane of the stomach. The rapidity of its production, its freedom from odour, and its sudden disappearance, (possibly from re-absorption) rather favour this theory of its origin than that attributing it to fermentation or to air-swallowing.

Whether the symptoms of chronic indigestion are due to pathological changes in the wall of the gall-bladder, or to disturbance of its function with biliary stasis as the result of these changes, or to stones, is still unexplained, but this in no way precludes the usefulness of their recognition as an indication of some disease process in the biliary tract and the necessity for its treatment.

HYPERCHOLESTEROLEMIA AND GALL-BLADDER CONDITIONS

Experience has taught us the greater frequency with which gall-stones and cholecystitis occur in women than men, and in married women who have borne children than in single women. No reasons for this were forthcoming until the recent researches on blood chemistry enabled a study of the presence of cholesterol in the blood to be made.

The technical methods used in estimating cholesterol have been very difficult and consequently not a great deal has yet been accomplished in its investigation. That normal blood contains a small amount (150-180 mg. to 100 c.c.) of cholesterol is now accepted, as is also the fact that normal bile contains approxi-

mately 20-80 mg. to 100 c.c. As most gall-stones contain 75 to 90 per cent of cholesterol, it is natural to look for some increase in the amount of blood-cholesterol in women who have borne children, and it is now known that the blood-cholesterol does increase during pregnancy, beginning about the second month, gradually increasing to the eighth month, and then slowly returning to normal about three to six weeks *post partum*.

The intake of fats in diet may also influence the amount of blood-cholesterol. McMaster² has shown that a diet high in cholesterol content (yolk of eggs, cream, liver, brains, sweet-breads, or other animal fats) will increase the cholesterol output. He found also that the quantity of food taken affected the amount of cholesterol.

The cholesterol content of the blood is increased at times by the presence of other disease conditions (Wilensky³) especially arteriosclerosis, diabetes, and nephritis.

The fact that gall-bladder disease and stones occur so commonly in fat women suggests that some relationship exists between the disturbance of fat metabolism which results in this large deposit of fat in the subcutaneous tissues and the diseased condition of the gall-bladder. Whether the increased amount of cholesterol in both the blood and the bile is the responsible factor, it is impossible to say, but there is no question that individuals who are found to have gall-stones after forty years of age show evidence that their ability to metabolize fats is greatly altered. Some of this change may be due to food intake, as women during the puerperium often increase the amount of cream, milk and eggs in order to produce breast-milk of sufficient quantity and of rich quality for the supply of the nursing baby. This alone hardly seems an adequate explanation, because many women adopt these measures without subsequently having gall-stones or increasing in weight. This increase in weight is attributed by some to the sedentary life these women live, but many of them lead a very active hard-working life and still grow fat in spite of this. Others, too, increase in weight on what would appear to be an ordinary diet with no increase in fatty substances, indicating that the underlying cause cannot wholly be either food intake or lack of exercise. In such cases, it would

appear that some change has occurred in their process of metabolism of fats, as the result of which absorption and deposition occur more readily.

Wilensky⁴ suggests that hypercholesterolaemia in cases other than pregnancy may be a fatigue phenomenon, in which the liver cells are unable to handle the excess of cholesterol, a condition similar to excess products in muscle cells.

The recognition of the fact that many patients who are found to have gall-stones almost certainly at some time during their formation suffered from hypercholesterolaemia makes one consider just what relation this change in the blood had to do with the formation of the stones. On the one hand, we know that a periodical increase of cholesterol in the blood has existed; on the other, we find in examining cross sections of gall-stones layers of almost pure cholesterol. It does not seem unreasonable to assume that these two facts are closely related to one another. If this assumption is accepted, then the part that the biochemical changes in the blood and bile plays in gall-stone formation becomes of much greater significance. During the last decade, attention has been almost entirely focussed on infection of the gall-bladder as the cause of gall-stones, and the treatment applied has been based on this theory. From a study of many gall-bladders and gall-stones, it would appear that both the above causes have been active, in some cases, the biochemical factor predominating, in others, the infective. In the latter group but little change in our methods of treatment is called for, unless it be in a small proportion, in which untoward symptoms persist following cholecystectomy. But if cases do occur in which the chief factor in the production of gall-stones is a biochemical one, and a minor and negligible one is of an infective nature, then it becomes a question whether such cases might not be treated much more conservatively, *i.e.*, by removal of the stones, and, subsequently, by preventing the possibility of hypercholesterolaemia occurring by restriction of diet and other measures to be mentioned later.

The full appreciation of hypercholesterolaemia in relation to the formation of stones becomes of still greater significance when the possible prevention of gall-stones is considered. If we think of the life-history of a case in

which gall-stones have been found, we can go back to the time when at, say, twenty-five years of age, during a pregnancy, the patient with a high blood-cholesterol content suffered from a mild cholecystitis. Were we again treating this patient at this initial stage, could her future life have been so guided by our advice and treatment as to prevent her subsequently developing gall-stones and a chronic cholecystitis? That is really the problem practitioners should be trying to solve as they see and diagnose this condition in the present day.

Three outstanding causes contribute to the tendency for such cases to become chronic and develop gall-stones, namely: (1) biliary stasis; (2) hypercholesterolemia; and (3) infection of the biliary tract.

BILIARY STASIS

Does our knowledge enable us to prevent the tendency to biliary stasis?

If it is accepted that one of the factors in emptying the gall-bladder is the change in intra-abdominal pressure brought about by respiratory movement, then advice may be given the patient which will cause increased respiration. The readiest means of applying this is by encouraging exercises which will bring about an increase in the respiratory effort. Some patients will undertake to carry out breathing exercises several times a day, but just as satisfactory results can be obtained with much more pleasure and much less mental effort, by urging them to engage in some of the many sports of the present day. Even such a mild exercise as walking causes more respiratory interchange than sitting in a limousine. Age need be no bar to such a game as golf, even well up in the sixties.

The experimental work of Meltzer and Lyon (see Winkelstein and Aschner)⁵ has demonstrated that biliary stasis may be decreased by the use of magnesium sulphate in a concentrated solution in the duodenum. For a time it was considered necessary to use a duodenal tube for this purpose, but it has now been shown that oral administration will succeed just as efficiently and with much less irksomeness to the patient. The patient should take the solution on rising in the morning, preferably about an hour before breakfast, so graduating the size of the dose that diarrhoea is not

produced. The amount will vary from half a drachm upwards, depending upon whether or not any tendency to constipation exists, in some cases reaching as high as four drachms. In advising this method, Hurst⁶ lays particular stress on the fact that the patient "must understand that the salt is given primarily for biliary drainage and not as an aperient."

HYPERCHOLESTEROLEMIA

Although the prevention of an excess of cholesterol in the blood and bile is impossible at certain times, still the realization that its presence may contribute to such a disturbing condition as gall-stones, should stimulate the profession to keep this fact in mind and do all that is possible to keep the amount of cholesterol within normal limits. As one of the most frequent states in which hypercholesterolemia occurs, is pregnancy, probably the child-bearing period of a woman's life is the one when most gall-stones begin to form. Medical men should, therefore, be on the look-out for any indications suggesting cholecystitis between the ages of eighteen and forty-five.

If such a condition has been diagnosed in a patient, then advice should be given which will help to reduce the amount of cholesterol in the system. The chief means of accomplishing this is by control of the diet. Articles such as the yolk of eggs, cream, liver, brains, and animal fats should be eliminated from her regimen or reduced to a minimum. The quantity of food taken should be such that no increase in weight occurs. Although the elimination, or even restriction, of such common foods as eggs and cream would seem to be a simple matter, still it is surprising how difficult it often is to make the patient live up to it conscientiously, especially as she suffers from no immediate results if she neglects to adhere to the prescribed regime.

The question of the advisability of a patient becoming pregnant again will also have to be considered in view of the high blood-cholesterol content that develops during this state. If she becomes so, her progress will have to be carefully supervised so that her nutrition and that of the fetus is amply cared for, at the same time avoiding any excess in such foods as will lead to the formation of cholesterol.

INFECTION OF THE BILIARY TRACT

Organisms may reach the gall-bladder and biliary tract through the blood, the bile, the lymphatics, or by continuity of tissue up the ducts from the duodenum. Any focal infections in the common situations may be the source of organisms, so their removal or prevention is carried out on the usual general principles. The possibility of living organisms reaching the duodenum in achlorrhydria has to be remembered, and, if present, treated by the use of dilute hydrochloric acid. "By this means," says Hurst,⁶ "the antiseptic acid barrier of the stomach is to some extent restored."

The methods suggested above to prevent biliary stasis will assist materially in reducing the chances of an infection of the gall-bladder becoming chronic or even permanent.

THE USE OF ANTISEPTICS

One of the earliest observations by Crowe showed that urotropin is excreted in the bile, an alkaline medium, a fact which has been more recently confirmed by Knott. The effects of its use in cholecystitis have been so difficult to calculate that but few practitioners have persisted in prescribing it. According to a recent article by Hurst⁶, satisfactory results are only obtainable by (a) the use of large doses, and (b) the administration of alkalis with it. "As the attainment of a maximal concentration of urotropine in the bile," he says, "is desirable in order to disinfect the biliary tract and especially the gall-bladder, we give the patient two mixtures to be taken together after breakfast, after tea and at 10 p.m., a glass of milk being drunk immediately after the last dose in order to prevent gastric irritation; the first mixture consists of a drachm each of sodium bicarbonate and potassium citrate in an ounce of water, and the second of 100 gr. of urotropine in an ounce of water. The first day, an ounce of the alkaline mixture is taken with half an ounce of the urotropine mixture; the dose of the latter is increased by a drachm each day until a full ounce is taken. . . . The double mixture is taken regularly for several months; occasionally the administration of the urotropine has to be interrupted for a few days,

after which the dose is gradually raised from 50 to 100 gr." Personally, I have had no experience with the use of urotropine in such large doses, but if its use does not cause any ill effects, I would consider that the above method should be given a very thorough trial, because the chance of ridding the biliary tract of an infection by any other means than surgical intervention have so far met with but little success. If a course of treatment of this kind during a few months will help to save the patient from a chronic cholecystitis and possibly gall-stones, with their distressing symptoms lasting for years and a surgical operation at the end of it, then its use would appear to be justified.

In the present age, the medical profession are treating the end-results of a prolonged chronic disease by excising gall-bladders, or draining them after the removal of gall-stones. Has the time not arrived when every effort should be made to recognize the presence of disease processes in the biliary tract in their initial stage, and to do everything possible to prevent the development of large thickened chronically inflamed gall-bladders and the formation of gall-stones. If every practitioner attending confinement cases would watch them carefully for the early signs and symptoms of cholecystitis, he will recognize more and more of them at this early period and be in a position to advise his patients intelligently just what treatment they should undergo and the dietary restrictions to which they should adhere in the future. By the adoption of such measures, the number of cases that will attain the advanced stages of this disease in the future and necessitate surgical treatment will be very materially reduced. The same general principles as to diet restriction and biliary drainage may be applied to male patients in whom an early diagnosis of cholecystitis has been made.

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RESULTS WITH BIRKHAUG'S RHEUMATIC TOXIN*

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FOLLOWING the report of Dr. Albert D.

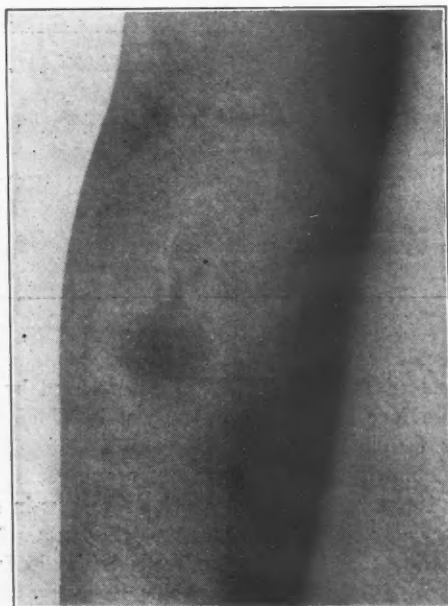
Kaiser, of Rochester, on his studies in skin reactions with the toxic filtrate produced by a non-methæmoglobin-forming streptococcus isolated from rheumatic fever, we felt that it would be of interest to make some studies with the same toxin in our clinic at the Sick Children's Hospital.

Dr. Konrad E. Birkhaug very kindly supplied us with all the toxin required to make the tests. Dr. Birkhaug had obtained from a five-year-old girl, who had rheumatic fever and endocarditis, a non-methæmoglobin-forming streptococcus in blood culture, and a similar strain from the mitral valve vegetations at autopsy. This strain was found to produce a potent soluble and thermo-stable exotoxin, one cubic centimetre of an eight day culture containing more than 1,000 skin test doses of the toxin. Utilizing the filtrate of an eight day culture of the non-methæmoglobin-forming streptococcus isolated from rheumatic fever patients, Dr. Birkhaug made skin tests similar to the Schick and the Dick tests with 0.1 c.c. of a 1 to 100 dilution of the toxin in normal saline solution to which had been added 0.5 per cent phenol. Originally, he made control tests with the same toxic filtrate subjected to 100° C. for more than one hour. He noted later, however, that the toxin heated for a few hours still remains heat stable and so does not lend itself for control purposes. We used for control tests, therefore, simply a 1 in 100 dilution of the lot of Douglas broth which was employed in the production of the rheumatic toxin, and to which was added 0.5 per cent phenol for preservative purposes.

Birkhaug had noted that the skin reactions with the filtrates from cultures of *S. scarlatinae*, and the *S. erysipelatis* as well as from *S. viridans*, were positive in the same percentage in normal persons and in persons with definite histories of rheumatic fever. On the other hand, when normal persons were tested with his rheu-

matic toxin, it was found that 15 per cent reacted positively, while in those with rheumatic fever manifestations about 70 per cent reacted positively. These results suggested a possible relationship between the toxin produced by the non-methæmoglobin-forming streptococcus of Birkhaug and the hypersensitive state of the skin of persons stigmatized by rheumatic infection.

The test is made in the same manner as the intracutaneous tuberculin or the Schick or Dick tests, by injecting 0.1 c.c. of a 1 in 100 dilution of the toxin. The forearm is the most convenient site. The results are read in 24 hours. Reactions appear earlier, but the maximum redness is usually present at this time, after which it rapidly disappears. In most instances the positive reactions produce an erythema about 2 cm. in diameter, similar to that in a positive Dick test.



Briefly, Kaiser found that out of 87 children under two years of age, only 1 gave a positive test and this child at ten months of age had had several attacks of sore throat and apparent in-

* Read before the Canadian Society for the Study of Diseases of Children, Vancouver, June 29, 1928.

involvement of the joints. He found that 20 per cent were positive when there was no history of rheumatic infection. A group, subject to repeated attacks of sore throat only, without a definite history of rheumatic infection, reacted positively in 35.7 per cent, while a rheumatic group was positive in 72.2 per cent. In children having chorea and rheumatic fever he found the test positive in 75 per cent. In children with rheumatic endocarditis the test was positive in 83 per cent. Children complaining of pain in the joints reached 63 per cent positively, and children with scarlet fever showed only 28 per cent to be positive. Birkhaug found that there was no parallel reaction with the Schick or Dick

As will be seen from the table, our cases were divided into two groups,—one having a strong family history of rheumatism and a history of rheumatism or chorea in the child, with or without heart involvement; and one without a family history, but with the history in the child as in the first group. Apparently, the family history has little relation to the reactions. We have only a very few cases in which there was neither family history, history in the child of rheumatism, nor physical signs of rheumatism. In the first group it will be seen that our percentage of positive reactions in children having a definite history of rheumatism and involvement of the heart is only roughly about half as

TABLE

FAMILY HISTORY OF RHEUMATISM

	Total Cases	Pos.	Neg.	Positive Control	Per Cent of Cases Positive
History of rheumatism in a child, with involvement of the heart.	30	11	19	0	36.6
History of chorea, or of chorea and rheumatism, with involvement of the heart.	5	5	0	2 slightly positive	100
History of rheumatism in a child, without involvement of the heart.	10	6	4	0	60
History of chorea, or of chorea and rheumatism, without involvement of the heart.	8	4	4	0	50

NO FAMILY HISTORY OF RHEUMATISM

	Total Cases	Pos.	Neg.	Positive Control	Per Cent of Cases Positive
History of rheumatism in a child, with involvement of the heart.	17	6	11	2 slightly positive	35.3
History of chorea, or of chorea and rheumatism, with involvement of the heart.	10	5	5 (2 Sal)	1 slightly positive	50
History of rheumatism in a child, without involvement of the heart.	3	0	3	0	0
History of chorea, or of chorea and rheumatism, without involvement of the heart.	8	7	1	1	87.5
No history of rheumatism or chorea. Heart normal.	9	1	8	0	11.1

tests. Noticing that the control tests were consistently negative, he discontinued doing them.

About 80 per cent of the cases tested by us were done in the Out-patient Cardiac Clinic, 20 per cent being done in the wards. At first it was noted that, although we were getting a moderate percentage of positive reactions in the Out-patient Clinic, they were getting only a few positive reactions in the wards with children having a definite history of rheumatic infection. This seemed hard to explain, but a possible explanation may be that all those cases in the wards were or had been having large doses of salicylates for some time and that this may be a factor influencing the test.

large as Kaiser found. On going very carefully again through the histories of these thirty cases, one found that twelve of the patients who reacted negatively had been receiving large doses of salicylates, and these, by the way, included a fairly large percentage of the cases which had been tested in the wards, and seven had had their infection more than three years previously, with no suggestion of any rheumatic recurrence since. This suggested two factors which might have a bearing on this test which, although not yet proved, seemed to be a factor throughout the comparatively small number of cases which we tested; the one being that cases with a definite history of rheumatic infection, and which we ex-

pected to react positively, frequently did not do so when they had been having large doses of salicylates, particularly over a period of time; and the other, that cases which had had a definite history of rheumatic infection some years previously, but with no evidence of recurrence of recent date, frequently were also negative to the test. In this regard it would seem to be different from the tuberculin test, in which, once there has been infection, the allergic phenomenon of a specific nature persists. If a positive reaction, on the other hand, indicated a susceptibility to infection with the streptococcus isolated from rheumatic fever, its clinical usefulness can easily be understood. Kaiser felt that it did not, because of its being positive in the presence of and persisting after acute rheumatism. However, we know that rheumatism does not produce an immunity, and one would not expect it to act as does scarlet fever or diphtheria with the Dick and Schick tests. This is a point which merits future study. Again, the large percentage of positive reactions which were present in cases having had chorea will be noted. If it be true that large doses of salicylates have a bearing upon the hypersensitive state of the skin in persons susceptible to rheumatic infection, it might account for this much higher percentage of positive reactions, because it is very generally felt in this clinic that large doses of salicylates have little effect on chorea

as such, and a large percentage in this group will not have had the large doses of salicylates that the first group will have had.

In the small group in which we have absolutely no evidence of rheumatism it will be seen that we have only one giving a positive reaction. No doubt, if the group were larger, the percentage would be altered. However, these cases were picked as those least likely to have any rheumatic susceptibilities and, although it would suggest that one can clinically to a certain extent select the individuals least likely to rheumatic infection, it also suggests the possibilities of the Birkhaug test as an aid in discovering those individuals susceptible to rheumatic infection who may or may not give clinical evidence of it.

In conclusion, it would seem that there is some relationship between the hypersensitive state of the skin and either the susceptibility to this infection, or the fact of having had rheumatic infection as shown by the Birkhaug test. At present it is not clear whether this is purely an allergic phenomenon, as in the tuberculin test, or whether it indicates susceptibility, as do the Schick and Dick tests.

There are points against both theories and future study seems merited in order to discover the exact significance of this test and the factors which influence it.

TREATMENT OF UNDULANT FEVER.—Undulant fever, like typhoid and other bacteriæmias, is very resistant to the ordinary therapeutic measures. Drs. H. Darré and H. Lafaille, of the Paris Academy of Medicine, report complete and speedy cure of the disease through the use of acriflavine. In one case an intravenous injection of 0.2 gm. caused a temperature that had lasted longer than two months to subside within twenty-four hours. The procedure recommended is as follows. Three intravenous injections are given. The first is 0.2 gm.; the second is 0.3 gm., given two days afterwards; the third is 0.4 gm., three days after the second. Relapses, should they occur, are treated in the same way as the original attack.

DIFFERENTIATION BETWEEN CORONARY THROMBOSIS AND ACUTE ABDOMINAL CONDITIONS.—A few cases in which a differential diagnosis had to be made between coronary thrombosis and angina and a lesion of the upper part of the abdomen are reviewed by J. P. Anderson with the purpose of emphasizing the following points:

Coronary thrombosis can simulate upper abdominal lesions. This condition should be kept in mind in every case of upper abdominal pain in a patient over 45 years of age, especially in a man. A history of previous heart trouble, anginal attacks or hypertension, a familial history of these diseases, or, on the other hand, a history of recurrent stomach trouble is very significant. On first examination the following signs should be watched for carefully: evidences of heart failure such as enlargement of the heart; basal râles in the chest; an enlarged, tender liver; cardiac irregularity, or gallop rhythm with a split first heart sound at the apex; a pericardial friction rub, or a low blood pressure in a patient known to have had a higher one previously. An electrocardiographic tracing is a necessity in such cases and since portable electrocardiographs are now available, there is no reason why tracings cannot be obtained. This is a condition in which the surgeon and internist should work in close cooperation, but the internist should also be a good cardiologist. A case is cited.—*J. Am. M. Ass.* 91: 944, Sept. 29, 1928.

THE USE OF BANANA AS A FOOD FOR HEALTHY INFANTS
AND YOUNG CHILDREN*†

BY JESSIE BOYD SCRIVER, M.D., AND S. G. ROSS, M.D.,

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DURING the past few years the banana as an article of food in the dietary of young children has risen from a place of ill repute to one of considerable value. This is probably due to several factors. Bananas have been used in the tropics for generations in children's diets, but in America there was for a long time a fear of disastrous consequences following the use of the fruit by the young child. This no doubt was due to a lack of appreciation of the degree of ripeness necessary for the proper digestion of the fruit, and also to a hesitation to add at an early stage varied articles of diet to the limited infant feedings of twenty years ago.

One of the first reports of the feeding of bananas in America is that of Myers and Rose,¹ who in 1917 reported the study of eleven adult cases to whose diet 900 grams of ripe banana were added, replacing in large part the carbohydrate of the control diet. After several days' observation on both control and banana diets, they concluded that there was no discomfort from the eating of the fully ripened fruit; also, that the carbohydrate was well absorbed from the intestine and no ill effects were observed even after the consumption of large quantities of the ripe fruit for several days.

In the same year, 1917, a report appeared in regard to children's diets by Pease and Rose,² who gave children of the ages of two to six and a half years diets containing banana to replace in varying amounts the carbohydrate of the ordinary diet. The diets were fed for periods of several days following control periods and stools were examined for unassimilated carbohydrate. The utilization of the carbohydrate was in direct proportion to the ripeness of the banana fed; with quite ripe bananas there was

almost complete assimilation of the carbohydrate—98.8 to 99.4 per cent. The impression of those who observed these cases was that the banana test meals tended to produce some constipation, but no positive evidence is given that the bowel movements were influenced.

The value of the banana in the diet of the sick patient was suggested by Chase and Rose,³ who called attention to its combination of a high carbohydrate caloric content with a very low protein content. They found it most useful in the diets of nephritics who showed nitrogen retention, where a palatable diet, adequate in calories but low in protein, was desired. The use of the banana in the treatment of coeliac disease or chronic intestinal indigestion was first described by Haas⁴ in 1924. In this condition where there is a carbohydrate intolerance of varying degree, the ease with which the carbohydrate of ripe banana is tolerated and assimilated is at times spectacular, resulting in a marked improvement in digestion and weight curves.

Ten years ago Sugiura and Benedict^{5 & 6} showed by extensive experiments on albino rats that, whereas banana alone was deficient in protein and also probably in a growth-promoting vitamine, a combination of bananas and milk in proper proportion constituted a complete food. Recently several reports have been presented by von Meysenbug,⁷ Thursfield,⁸ and Johnston⁹ on the use of ripe banana pulp in the formulæ and diets of infants and young children as a means of providing added carbohydrate in an easily assimilable form. These reports have shown that the food was well tolerated, the patients gained weight satisfactorily, and Thursfield attributed definite improvement in the condition of several athreptic infants to the use of the banana. Vipond¹⁰ has made some observations on the use of banana flour as a food for healthy and sick infants.

Many analyses have been made of the edible

* From the Montreal Baby and Foundling Hospital and the Department of Paediatrics, McGill University, Montreal.

† Read before the Canadian Society for the Study of Diseases of Children, Vancouver, June, 1928.

portion of the ripe banana pulp and a summary¹¹ of these analyses gives us the following average figures:

COMPOSITION OF THE BANANA

		per cent
Water	75.	" "
Carbohydrate	22.	" "
Sugars	19.8	" "
Fat	0.6	" "
Protein (N x 6.25)	1.3	" "
Cellulose	0.8	" "
Ash	0.8	" "
Calcium	0.009	" "
Magnesium	0.028	" "
Potassium	0.401	" "
Sodium	0.034	" "
Phosphorus	0.031	" "
Chlorine	0.125	" "
Sulphur	0.010	" "
Iron	0.0006	" "

Depending on the stage and manner of ripening, the sugars consist of sucrose, 2 to 14 per cent, and the remainder invert sugar. The accessory food factors have been investigated and it has been established¹² that in vitamine-A value the banana is equal to vegetables fairly rich in this vitamine—for example, green peas. In vitamine-B it has been found to be the equivalent, weight for weight, of tomato juice. In vitamine-C, the anti-scorbutic vitamine, the banana compares favourably with oranges and tomatoes, as has been shown by Johnston (quoted by Eddy and Kellogg)¹³ who presents clinical and x-ray evidence of the cure of scurvy in an infant by the use of boiled milk and fresh ripe banana pulp. The banana is deficient in the anti-rachitic vitamine and little is known of its vitamine-E content.

The observations presented in this preliminary report are part of a study conducted from January to December, 1927, on the value of banana as a food for infants up to two years of age, one phase only of the subject being considered, i.e., use as a food for healthy infants

over a long period of time. The work was carried out at the Montreal Baby and Foundling Hospital, where there was an excellent opportunity to make careful observations. No infants under three months of age were included in the study. For purposes of classification the infants were divided into four age groups and each of these groups was subdivided into two groups: A, the control group, i.e., infants who were not fed banana; B, infants who were fed banana in place of certain articles of food in the control group.

Group I	Age 3-6 Months.
Group II	" 6-12 "
Group III	" 12-18 "
Group IV	" 18-24 "

The infants, on reaching the age limit of one group, automatically passed into the next group and on to a different diet.

The experiment was carried out as follows. Infants in a good state of health were divided indiscriminately into control and banana groups. The control groups were given a diet suitable to the age and weight of the child. In the banana groups, banana was substituted for certain articles of diet which included sugar, potato, and cereal (farina). As will be seen from Chart I, these foods are for practical purpose carbohydrate foods containing small amounts of protein and traces of fat. They were fed in equivalent caloric amounts; e.g., one ounce by weight of banana pulp was used in place of one-quarter ounce of sugar, one ounce of potato or two fluid ounces of farina (made up from one ounce dry weight in eight ounces of water and after cooking made up to the original volume).

The bananas were carefully selected and used only when ripened. The fruit was kept at room temperature, not in a refrigerator room, and

CHART I.
Chemical Composition of Banana, Potato, Farina

	Protein	Fat	CHO	Salts	Water	Vitamines
Banana	1.3	0.6	22 total	0.8	75	A + + B + C + + + D -
Potato	2.2	0.1	18.4	1.0	78	A + B + + C + + D -
Farina Cooked (1 in 8)	1.4	0.2	9.5	.05	89	-

Equivalents:— Banana— 1 ounce wt. = 28 calories,
Potato — 1 ounce wt. = 25 calories,
Farina 1 in 8 — 1 fluid ounce = 14 calories.

was considered ready for use when brown spots appeared on the skin and there was complete absence of any green colour on the skin, even at the tip. Ripened in this way and to this degree, the starch of the banana is practically all converted into sugar.

In the case of infants of three to six months the banana was mashed finely, beaten, and incorporated as an emulsion in the milk formula. In the diets of the older infants where banana replaced cereal or potato it was mashed up finely and fed as such.

A list of the diets fed to the infants of the four groups is given, and it will be noted that in Group IV. B., it was necessary at times to give as much as five and a half ounces of banana daily in order to give the equivalent of the cereal and potato used in the control group. This amounts to between two and three bananas daily, depending upon their size. When infants of Group I. B. advanced to Group II. B., they continued to receive half of the added sugar of the milk feeding in the form of banana pulp as well as the banana replacing the cereal. During the latter half of the year 1927 a similar replacement of banana for sugar was made for all infants of Group II. B.

DIET I

THREE MONTHS—SIX MONTHS

A. Control:

Milk—1 3/4 ounces per lb. per day.
Sugar—1/10 " " " " "
Water—3/4 " " " " "
Orange juice—1 ounce daily.
Cod liver oil—1/4 ounce daily.

B. Banana:

Substitute banana for one-half of added sugar in control diet.

DIET II

SIX MONTHS—TWELVE MONTHS

A. Control:

Milk—1 3/4 ounces per lb. per day.
Sugar—1/10 " " " " "
Water—3/4 " " " " "
Cereal—2-4 ounces per day.
Soup—4 ounces per day.
Orange juice—1 ounce daily.
Cod liver oil—1/4 ounce daily.
Nine to twelve months:
Green vegetables—2 tablespoonfuls.
Toast—1 ounce.

B. Banana:

1. Substitute banana for cereal.
2. Substitute banana for cereal and one-half of added sugar in control diet.

DIET III

TWELVE MONTHS—EIGHTEEN MONTHS

A. Control:

Milk—30 ounces,
Cereal—4-5 ounces,
Soup—4 ounces,
Potato—1 ounce (Wt.),
Vegetable—2 tablespoonfuls.
1/2 egg or 1/2 slice bacon,
Toast—2 ounces,
Butter—1/4 ounce,
Pudding—3 tablespoonfuls.
Cod liver oil—1/4 ounce daily.
Tomato juice—2 ounces daily.

B. Banana:

Substitute banana for cereal and potato.

DIET IV

EIGHTEEN MONTHS—TWENTY-FOUR MONTHS

A. Control:

Milk—20 ounces,
Cereal—6-8 ounces,
Soup—4 ounces,
Potato—1 1/2 ounces (Wt.),
Vegetable—2 tablespoonfuls,
Beef—1 ounce or 1 egg,
Toast—3 ounces,
Butter—3/8 ounce,
Cooked prunes or apple sauce—1 ounce,,
Pudding—3 tablespoonfuls,
Cod liver oil—1/4 ounce daily,
Tomato juice—2 ounces daily.

B. Banana:

Substitute banana for cereal and potato.

In most cases the feedings were taken eagerly, although occasionally infants tired of the fruit after a time; however, we did not feel that this was an unfavourable criticism of the banana. It would be unusual if infants fed with banana day after day did not occasionally tire of it.

The infants were weighed weekly and the tables show the average gain of each infant. Observations were made on the following points: appetite, digestion and general health, including infections.

Observations.—Fifty-eight infants were studied in all. They were observed over periods varying from twelve to fifty-two weeks. These were consecutive periods except for one time during the summer when practically all the infants in the hospital had a digestive upset varying in degree from mild to severe. This disorder attacked both groups indiscriminately, but it was felt safer to discontinue the banana feeding in all the infants under one year for a period of two weeks. There was absolutely no evidence that this disorder was due to the feeding of banana.

Appetite.—In most cases the banana was taken well. There were several exceptions to this.

Infant No. 29, age 5½ months, Group I. B., at first refused the banana feeding in the bottle and vomited most of that taken. After two weeks' rest the banana was given again in very small amounts incorporated in the milk feeding, at first only two drops of banana emulsion being added to each bottle. This was gradually increased and it was found possible to establish quickly a tolerance and relish for the banana feeding in which the full amount of banana was given. Infant No. 40, age 13 months, Group III. B., who was fed on the banana diet for twenty-eight weeks refused banana toward the end of the experiment. It was transferred to a control diet and this was taken slightly better. Infant No. 28, age 19 months, Group IV. A., was started on banana diet but persistently refused banana and any other food fed at the same time. It was therefore changed to the control diet which it took well. Infant No. 55, age 19 months, Group IV. B., grew tired of bananas after seventeen weeks. It was changed to control diet which was well taken. Speaking generally, then, one may say that banana as an article of food is well taken by infants.

Infection—We were interested to know whether there would be any difference in resistance to infection in the two groups. The majority of the infections were upper respiratory in nature and fortunately, during 1927, were of a mild type. We were unable to note any difference in the susceptibility to infection or clinical course of infections in the two groups.

SUMMARY

1. Ripe banana may be added to the diets of healthy infants from the age of three months onward with safety.

2. It may be used as a substitute for sugar and the other predominantly carbohydrate foods such as potato or cereal.

3. Infants fed on banana as a substitute for the above-mentioned foods take it well, digest it satisfactorily and show no change in the character of the stools. Their gain in weight over a period of weeks is roughly equal to those on the control diet.

4. The ripe banana thus provides a useful substitute for other foods of its class in healthy infants.

CHART II.
A—Control Groups. B—Banana Groups.

Group	Number Infants	Average Age	Average Weight	Average No. Weeks	Average Weekly Gain	Number of Infections
I. A.	5	3½ mos.	10 lbs. 13 oz.	11 wks.	5 oz.	4
I. B.	5	4½ mos.	13 lbs. 2 oz.	7 wks.	3.9 oz.	3
II. A.	12	6½ mos.	15 lbs. 4 oz.	18½ wks.	4.7 oz.	20
II. B.	16	7 mos.	15 lbs. 5 oz.	17 wks.	3.9 oz.	13
III. A.	14	13½ mos.	21 lbs.	13 wks.	2.7 oz.	8
III. B.	16	12½ mos.	20 lbs. 13 oz.	14 wks.	2.9 oz.	9
IV. A.	11	19½ mos.	24 lbs.	16 wks.	2.5 oz.	9
IV. B.	12	18½ mos.	25 lbs.	19 wks.	1.8 oz.	7

Digestion—Apart from Case No. 29 above-mentioned, there was no apparent difference in the digestion of the control and of the banana groups. The stools were indistinguishable in the two groups and we have no evidence that, in the amounts which were fed, the banana is either constipating or laxative in its action.

Weight—From the accompanying chart it will be seen that the control groups tended to show a slightly greater average gain in weight than those on the banana diet. The gain in both groups, however, was satisfactory and we do not think that the difference is of significance. At the end of the experiment it was impossible to make out any difference clinically in the condition of the two groups.

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STREPTOCOCCUS MUCOSUS OTITIS*

BY I. R. VAILE, M.B.,

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THE subject of streptococcus mucosus otitis has received very scant attention in the modern text-books of otology, or in the current English and American literature. This is not deservedly so, since the recognition of this type of infection as a distinct clinical entity is one of the most important practical contributions to the subject of otology in the past five years.

A comparison of the clinical course of events in a case of acute otitis media with that in mucosus otitis will best serve to explain the latter condition.

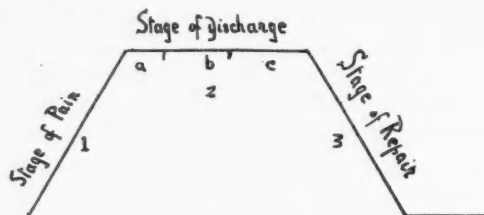


FIG. 1

Fig. 1 represents graphically the course of events in a case of acute suppurative otitis media. Stage 1 is the stage of pain. This period is usually accompanied by a rise in temperature, and in infants may be ushered in by vomiting and convulsions, or symptoms of meningeal irritation. The temperature varies between 98° and 105° F. and usually falls to nearly normal when the first passes into the second stage, i.e., when the drum perforates spontaneously or myringotomy is performed.

Stage 2 is the period of discharge, and is divided into sub-periods indicated by a, b, and c: a represents the time of sero-sanguineous discharge; b represents sero-purulent; and c, purulent discharge. This second period may last three to four weeks or longer. The discharge gradually decreases in amount and this stage passes over into stage 3, that of repair. Slight rises of temperature during this period of repair are of great significance as compared with the high elevations met with in the first stage.

* From Prof. H. Neumann's Clinic, Vienna.

Meningeal irritation during the first stage is usually an evidence of toxic irritation, the so-called "meningismus" that may occur during any acute infection, although cases of true meningitis occurring in the first stage have been reported—"otitis cum meningitis." Slight rises of temperature during the third stage and symptoms of meningeal irritation are of serious import and usually require operative interference.

Now compare Fig. 2 with Fig. 1. This is the typical curve for streptococcus mucosus otitis. Stage 1 is the same as in the ordinary acute middle ear infection; stage 2 is considerably

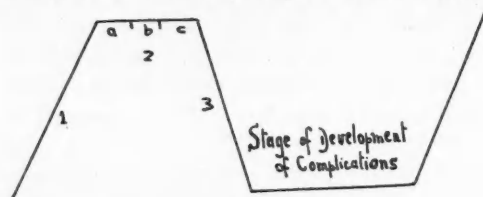


FIG. 2

shortened and passes in a few days into the apparent stage of repair. It is during this latent or symptomless period that the havoc is being wrought. The patient has no pain or temperature, and he may be unaware that his hearing on the diseased side is markedly diminished. This period may persist without symptoms for a considerable length of time, and the recommendation of operation is not gratefully accepted. Operation during this symptomless latent period is the ideal procedure, but it is difficult to convince the patient of the urgent necessity. When left untreated there results very extensive destruction of bone, and there is a very marked tendency towards the production of intracranial complications—septic sinus thrombosis and all degrees of pachymeningitis.

The following case will serve to illustrate the various points.

CASE

C. B., female, aged 26; seen on September 13th, complaining of pain in right ear for two days. The temperature was 100° F. No

tenderness over the mastoid; the drum membrane was red and bulging; the landmarks blurred. Paracentesis was performed, using Billroth's mixture to produce general anesthesia. The incision was carried from the postero-inferior quadrant up and through the posterior fold into the attic, to provide adequate drainage. A small quantity of blood and pus was obtained. A drain of iodoform gauze was introduced and the patient advised to apply dry heat at home and return next day.

September 14th. Temperature, 99° F. A small amount of discharge. A new drain was introduced and the patient advised to carry on with the dry heat at home.

September 15th. Her condition was unchanged, and she was sent on for roentgen examination.

September 16th. No discharge. Temperature, 98.4° F. The patient had then no spontaneous pain; no tenderness on pressure over the mastoid. The examination of the drum showed no evidence of the incision. The drum was greyish red, and very much thickened; the landmarks were indistinct, but it was possible to make out the short process and the handle of the malleus. There was no light reflex. There was slight bulging in the upper posterior quadrant. Cochlear tests; Weber, localized to the diseased side; Rinne, negative; Schwabach, lengthened. C,1, markedly shortened; C,4, normal. The whispered voice with Barany noise apparatus in the normal ear was heard only *ad concham*. X-ray report; "pneumatic mastoid; mixed type. Clouding of the whole mastoid process with loss of cell structure in the region of the antrum." The patient was admitted to the hospital for observation. Myringotomy under strict asepsis was performed; a small amount of pus was obtained and sent to the laboratory.

September 17th. Temperature 98.4°; no pain, very little discharge. The patient complained of a dull feeling in the diseased ear. The incision was almost completely closed; the bulging in the posterior quadrant had become nipple-shaped. With the Valsalva method only a tiny bead of pus exuded from the tip of the nipple. The "Solux" lamp was applied for from one-half to three-quarter's of an hour at a time. The patient was comfortable, with good appetite.

and slept well. She was sent for x-ray examination.

September 18th. Condition unchanged. The nipple was removed to provide better drainage. The patient was perfectly comfortable except for the dull feeling in her ear. X-ray examination showed extensive destruction. Bacteriological report showed the organism to be a streptococcus, but not encapsulated. Operation was advised, but refused, and the patient went home in spite of all advice to the contrary.

September 19th. Returned to the out-patient department. Aside from the deafness, she had no complaint. There was no pain, no tenderness on pressure, and no discharge. Examination of the drum membrane showed it to be very much thickened and grey. The upper posterior quadrant presented a very large nipple, and when Valsalva was practised, a very tiny quantity of pus emerged from an eccentric tip. The patient was advised to come into hospital for operation, but refused. Myringotomy was again performed, and the material obtained sent to the laboratory.

September 20th. Condition unchanged. No discharge; some bulging of the posterior-superior wall. The laboratory report showed a streptococcus, but no encapsulated organisms. The patient returned to the clinic the same day at 8 p.m., complaining of very severe headache. Temperature, 100.6°. There was slight tenderness over the mastoid. Examination showed an increased bulging of the posterior-superior wall, and the patient was admitted for operation. The operation, at 9 p.m. showed very extensive destruction. Some free pus was obtained. It was stringy in character and two tubes were inoculated from it for bacteriological examination. The dura and the sinus wall were exposed, and no change found in them. All the cells were exenterated and the wound packed with iodoform gauze and left open. The patient made an uneventful recovery.

The bacteriological report showed the presence of an encapsulated streptococcus.

COMMENT

An analysis of the above history shows that there is no one definite sign to indicate that the condition was caused by *S. mucosus*. It was only after the analysis of many hundreds of cases of this nature that it was realized that

here was a special type of otitis. Repeated bacteriological examination, as shown by E. Urbantschisch,² did not always reveal an encapsulated organism. If repeated cultures are made, sooner or later *S. mucosus* will be found. The organism is very variable and is more often found without a capsule than with one. It is necessary to realize that we are here dealing with an urgent clinical condition, and that waiting for a bacteriological report is like waiting for a report in a case of diphtheria before administering antitoxin. It is very important to recognize the latent symptomless period and to urge operation. *S. mucosus* has a marked tendency to produce intracranial complications which appear like a bolt out of the blue sky. In infants the diagnosis is rendered more difficult because one has to rely on the clinical picture only, the hearing tests and x-ray being of no value.

SUMMARY

The condition of *S. mucosus* otitis is very common, as judged by the number of cases seen at this clinic. It is less common in infants than in adults. It is characterized by a very much shortened² stage, followed by a symptomless period. The patient is fairly comfortable, and complains only of a dull feeling in his affected ear. Examination shows a very slight rise in temperature or no rise at all; absence of pain or tenderness on pressure over the mastoid region. The drum membrane has a marked tendency to close after paracentesis. There is very scant discharge. The drum membrane is grey and very much thickened. There is a decided tendency towards intracranial complications. Operative interference is indicated during the latent symptomless period.

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GOLF BALLS AS A SOURCE OF LEAD POISONING.—H. W. Wuerthele reports the case of a school boy, aged 16, white, who complained of severe abdominal cramps that he had had for two weeks. The cramps, starting from the lower quadrant of the abdomen, extended down the legs to the feet and lasted from five to ten minutes. These occurred at irregular times, and there were as many as from four to five paroxysms in a day. August 5, the cramps started while the patient was caddying at the golf links and lasted from 1.45 to 5 p.m. They were so severe that the patient was unable to walk and had to lie on the ground. He then started to walk home and had to hold the abdomen with his hands while walking. He did not have any vertigo, headaches or syncope. There was no cough, shortness of breath or palpitation of the heart, and nausea, vomiting and eructation were absent. The bowels were regular. Genito-urinary examinations did not reveal burning, frequency or nocturia. There was no numbness, or tingling of the extremities. The patient complained of fatigue after the paroxysms. The abdomen was retracted, boardlike and very muscular. The urine was a clear amber with a specific gravity of 1.025; it was negative for sugar and albumen. Microscopical examination did not show any casts or red blood cells. The red blood cells num-

bered 5,250,000, and the white blood cells, 10,150, with polymorphonuclears, 80 per cent; lymphocytes, 20 per cent, and haemoglobin, 95 per cent. There were no stippled cells seen; poikilocytosis and anisocytosis were absent. The Wassermann reaction was negative. A diagnosis of acute lead poisoning was made. The syndrome was that of lead poisoning and Wuerthele questioned the patient closely as to the possible source of exposure to lead. The author found that the boy had been cutting open golf balls and rubbing the lead contained in a little rubber sac onto old balls that he had found about the links and that he was preparing for sale to some of the golf players for practice balls. He does not believe that this lead was absorbed through the skin. It is more probable that as the patient was in the habit of eating lunches, sandwiches, candies and cakes in a cafeteria on the links, the point of entrance to his system was through the gastro-intestinal tract from the hands. The patient was given six intravenous injections of sodium thiosulphate at intervals of three days, the initial dose of 0.3 Gm. being increased 0.1 Gm. at each subsequent dose. The author last saw the patient, Oct. 20, 1928. The reflexes had all returned, and he had apparently made a complete recovery.—*J. Am. M. Ass.* 91: Dec. 22, 1928.

Case Reports

REMOVAL OF A PRIMARY CARCINOMA OF LIVER*

By E. S. Hicks, M.D.

Brantford

A.W.F., a farmer, aet. 77, came to the Brantford Clinic on May 4, 1927. He stated that there was no past history of any severe illness. He gave, however, a history of trauma in the liver region fifteen years before. On an icy morning his feet slipped while lifting a full milk can and he fell on the handle of the can, causing an upper abdominal injury. From this he slowly recovered and for some years had no symptoms referable to this region.

Four months before coming to the clinic he noticed some upper abdominal enlargement and discomfort. He went to his family physician, and at the second examination a tumour was palpated. This grew rapidly. A diagnosis of probable carcinoma of the stomach was made and further examination was advised.

In reviewing his case at the clinic we found his general condition and appearance out of proportion to the size of the tumour. His appetite was splendid, his digestion good. There was no jaundice. In view of the subsequent findings his blood examination was surprising: red blood cells, 4,600,000 per c.mm; white blood cells, 15,000; hæmoglobin 90 per cent; colour index 0.9; polymorphonuclears 54 per cent; lymphocytes 24 per cent; eosinophiles, 22 per cent; the Wassermann test was negative.

Physical examination was negative, except for the mass in the epigastric region which was plainly visible and easily palpable. There was a slight increase in the liver dullness.

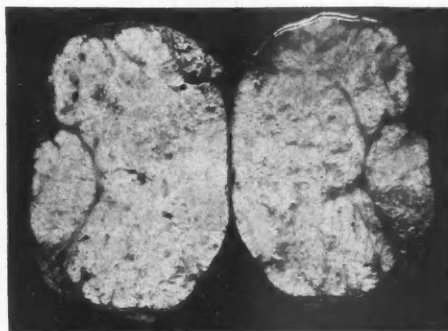
X-ray examination showed no œsophageal delay. The size of the heart was normal; chest clear, and the mediastinum normal. An orthotonic stomach, was demonstrated with no residue, and no filling defects; peristalsis was active. The pylorus was displaced downwards by the tumour present, but was patent and normal. The duodenum was displaced to the right, but there was no intrinsic deformity.

We felt that the tumour might be a pancreatic cyst presenting through the gastro-hepatic omen-

tum, and, for that reason and on account of the lack of any sign of cachexia, advised laparotomy.

Operation on May 6, 1927. An upper mid-line abdominal incision was made and a tumour the size of an orange, originating from the left side of the liver, came into view. The right lobe and the gall-bladder were normal. The left side of the left lobe was also normal. A band of cirrhosis, two inches wide, was present, running backwards through the mesial side of the left lobe. From and in this cirrhotic band the tumour arose. A careful abdominal examination revealed no other lesion.

Faced with our patient in good general condition and a tumour that could be removed we decided to remove it. The growth was excised by sharp dissection, the cut surface being sewn as cut with an interlocking double catgut suture,



Primary carcinoma of the liver.

drawn as tightly as possible without causing cutting. Three or four vessels required separate ligation. A rubber glove was spread out over the raw surface for tamponage and drainage. The usual abdominal closure followed. All the drain was out by the fourth day, and the patient left the hospital in thirteen days.

The inspection of the gross specimen showed an encapsulated tumour with some central degeneration. A small nodule, apparently a metastasis removed *en masse* with the parent tumour, proved to be a direct outgrowth of the main growth.

Pathological report by Dr. Luney, Ontario Institute of Public Health.

"Macroscopically, the specimen (see photograph) consists of an encapsulated rounded mass,

* From the Brantford Clinic.

measuring 9x8x7 cm. Capsule, smooth and of greyish-yellow colour. A fine connective-tissue network permeates the mass to form minute islands of greyish-yellow coloured cells. At the periphery a few small areas of compressed and distorted liver tissue are noted. Microscopically; carcinoma."

From May to August the patient did well. In August he showed slight icterus, but his appetite was good and there was no pain. By October he had had some pain requiring anodynes and had had an occasional hæmatemesis. He died early in November.

POINTS OF INTEREST

(1) The lack of the usual anorexia and cachexia; (2) the ease of removal of so large a central section of the liver; (3) a primary carcinoma of the liver arising in the site of an old trauma.

We would refer the reader to the review¹ by Counsellor and McIndoe, of the Mayo Clinic, in regard to the rarity of primary liver carcinoma and especially to their belief that 3 to 4 per cent of cases of cirrhosis, particularly of the portal type, will become carcinomatous.

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A CASE OF CHRONIC DIFFUSE NEPHRITIS IN A YOUNG CHILD*

By FRANK H. BOONE, M.B.,

Hamilton

Chronic diffuse nephritis occurring in childhood was first described by Gull and Sutton¹ in 1872, and since then, from time to time, reports have appeared of new cases, mainly in England and other European countries, but more recently in America. Many of these have shown a definite failure in physical development (dwarfism) which was apparent from early infancy, hence the names most commonly applied to them are renal dwarfism or infantilism.

CASE REPORT

B. J., female, born August 22, 1924; died October 24, 1927, at the age of 3 years and 2 months.

* Read before the Canadian Society for the Study of Diseases of Children, Vancouver, June 29, 1928.

Family History.—The paternal grandmother had chronic kidney trouble. There were two other children both living and well.

Past History.—A full-term child; normal delivery; breast fed to 8½ months of age. From the date of weaning, great difficulty in feeding was experienced. She refused almost all solids and if forced would vomit. She lived almost entirely on milk. At one year of age she weighed 16 pounds 12½ ounces. Cod liver oil was started at 7½ months. She had occasional mild upper respiratory infections and pyelitis at fifteen months of age, from which she made a good recovery.

Present History.—The patient was first seen March 15, 1926, at the age of nineteen months. The complaints were poor appetite, vomiting, and failure to gain in weight. Duration of the illness was 10½ months.

Physical Examination.—Temperature, 98.4° F. per rectum. Weight 16 pounds. Height 29 inches. She was a very poorly developed and undernourished child, rather anæmic in appearance, could sit alone, but was unable to stand. She was very irritable and objected strenuously to examination. Her mentality appeared below normal for her age. The anterior fontanelle measured two by two fingers; the frontal and parietal bossing was marked. The eyes were negative; no strabismus nor nystagmus. The nose and throat were apparently normal. She had ten teeth. There was moderate general glandular enlargement. The skin was moist and elastic, but very pale. There was marked beading of the costochondral junctions. The heart and lungs were normal, and also the abdomen.

The epiphyseal enlargements of the long bones were moderately marked and the muscles were poorly developed. The various reflexes were present and active.

Laboratory Examination.—Urine: colour, pale; reaction, alkaline; the specific gravity was not measured owing to having an insufficient amount in the specimen; albumen, negative; sugar, negative, and microscopical examination was negative.

The tuberculin test (intradermally, 1/10 mgm.) was negative.

Progress of the Case.—A diet and general feeding instructions were given, and, although her appetite remained poor, she slowly gained in the next 4½ months to 18 pounds 1½ ounces in weight.

On August 5, 1926, following a period of self-imposed starvation, she developed a typical state of acidosis, and while under treatment for this condition a number of specimens of urine were examined and they all showed faint traces of albumen. At this time, the parents were asked to observe more closely the amount of fluid taken and urine passed in twenty-four hours, and an attempt was made on a number of occasions to estimate the above. The fluid intake varied from 1,500 to 2,000 cubic centimetres, but as she was not trained it was impossible to obtain any accurate estimate of her total urine output. Nine hundred cubic centimetres was collected during one period, but this was by no means all that was passed.

The complete laboratory examinations of September 1, 1926, were as follows:—

The erythrocytes numbered 3,152,000, leucocytes 9,400 and the hæmoglobin 51 per cent. Non-protein nitrogen, 47 mgm.; creatinine 2.9 mgm.; and sugar 120 mgm. per 100 c.c. The urine was acid; specific gravity 1004; colour very pale yellow; albumen, a trace; and sugar, negative; microscopically, an occasional granular cast was seen. Repeated blood pressure readings were made from time to time and they varied as follows: systolic, 100 to 120 mm.; diastolic, 60 to 68 mm.

During the next fourteen months, the child changed very little. Her growth was almost nil and, although she gained a little in weight, as well as mentally and physically, she showed relatively no improvement. She was very slow in teething and never was able to stand. Her fluid intake and urine output remained approximately the same and the mother frequently spoke of the large quantity of water taken both day and night. The pathological urine changes were present at all times. There were frequent periods of complete loss of appetite and at these times she would become very drowsy. Mild upper respiratory infections were usually accompanied by gastro-intestinal disturbances, and it was during such an attack that she developed complete anuria and died on October 24, 1927, in a state of uræmia.

At the time of her death she was 3 years and 2 months of age; weighed 19 pounds, 10 ounces; and measured 31 inches in height.

Report of Necropsy (by Dr. Wm. J. Deadman, the Hamilton General Hospital).

The body was that of a white female child poorly nourished, about 31 inches in length and weighing about 20 pounds. Post-mortem rigidity and lividity were present.

Both pleural cavities were free from adhesions and had no excess of fluid. The pericardial sac was normal in appearance.

There was about 100 c.c. of straw coloured fluid in the lower part of the peritoneal cavity.

The trachea and bronchi showed considerable congestion of the mucosa. The right lung, on section, presented near the base a patchy broncho-pneumonia; the left lung resembled the right and showed also an early broncho-pneumonia of the base. The peri-bronchial glands were not enlarged.

The heart showed hypertrophy, being about 50 per cent larger than the average for a child of this age. All the valves were normal in appearance. The heart muscle was somewhat pale and slightly fibrous. The aorta and large vessels were normal in appearance.

The esophagus was normal. The stomach contained a small amount of cloudy fluid. The mucosa showed numerous submucosal hæmorrhages. The small intestine was normal throughout. The large intestine showed congestion of its mucosa, but no ulceration. The appendix was normal. The liver was enlarged and, on section, showed numerous areas of fatty change and was moderately congested. The gall bladder was normal and the bile ducts were patent. The pancreas showed no abnormality. The spleen, on section, was dark in colour and showed acute congestion. The mesenteric lymph-nodes were moderately enlarged.

The kidneys were smaller than the average. The capsules stripped off with some difficulty. On section, the cortex was pale in appearance, narrow, and appeared to be fibrous; the medullæ were somewhat darker in appearance. Both kidneys showed a generalized fibrotic change. The ureters were normal in size. The bladder was small and contained a few c.c. of urine showing albumen. The internal genitals were normal. The adrenal bodies were normal.

Microscopically, sections of the kidney showed fibrosis and many of the glomeruli were obliterated. The tubular epithelium showed advanced degeneration and the interstitial tissue of the kidney was much increased and in some places infiltrated with round cells.

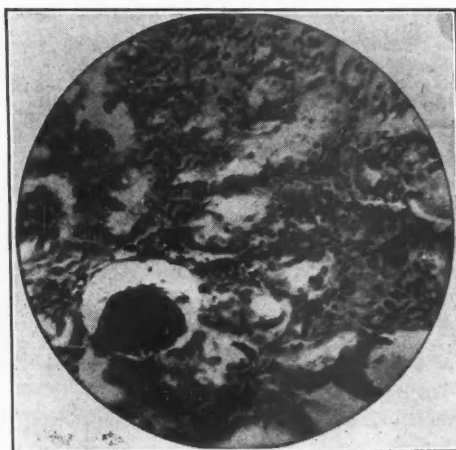


FIG. 1.—High power microphotograph of kidney section.

The anatomical diagnosis was: chronic interstitial nephritis; cardiac hypertrophy; congestion of the liver, spleen and colon; broncho-pneumonia.

SUMMARY

The outstanding points in this report are as follows: the difficulty in feeding, present at 8½ months of age and persisting until death; polydipsia; polyuria; failure in development, both mentally and physically; high blood pressure; secondary anæmia; consistent pathological urine changes; and death in the uræmic state. At necropsy, small contracted kidneys and hypertrophy of the heart were found.

Carl H. Greene,² in 1922, was able to find 27 cases of chronic diffuse nephritis reported in children under 10 years of age that met all requirements. Any with a history of scarlet fever or syphilis were carefully excluded. Of these cases 10 were in children under 3½ years of age and the ages varied from 6 weeks to 3 years. In all but two fairly complete pathological reports were given. Four showed definite hypertrophy of the heart muscle; a similar number, a definite lack of development. The author suggested that the kidney lesion in these cases was not only primary in nature but congenital in origin as well.

F. C. Hunt,³ in 1927, reported a case of renal infantilism and gathered together data on 54 other cases. In many there was no autopsy report and in some the clinical observations were not complete. All showed definite infantilism. Of the 55 cases only 7 were 3½ years or younger. Five of these were autopsied and only 2 showed cardiac hypertrophy.

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AN UNUSUAL CASE OF
INTUSSUSCEPTION

By D. SWARTZ, M.D.,

Salvador, Sask.

The patient, F.Z., male, 44 years old, single, was born in Buckowina.

Family History.—Negative, except that a brother has tuberculosis.

Personal History.—He came to Canada in 1908, and farmed most of the time, but also worked as a coal-miner and in a factory. In 1921 his gall-bladder and appendix were re-

moved; in 1922 he had gastro-enteritis; in 1926 he was operated upon for acute intestinal obstruction of unknown cause. Since 1926 he had suffered from occasional vomiting, belching, and abdominal pain.

Present Illness.—This began immediately after breakfast at 8 a.m., November 9, 1928. The onset was sudden, with intense sharp colicky pains, involving the upper half of the abdomen, beginning in the epigastrium and radiating to both sides and back. At 11 a.m. he vomited his breakfast; 3 p.m. profuse green thick vomitus; 6 p.m. profuse green watery vomitus; 7 p.m. profuse stercoraceous brown, faecal smelling vomitus. On the morning of November 10th, he vomited twice, the material being stercoraceous. The bowels had moved well at 6 a.m., November 9th, after which there was obstinate constipation, with no passage of gas. At 7 p.m. an enema was given, when a small amount of gas was passed, but otherwise it was ineffectual.

Examination.—November 9th, 6 p.m., temperature 98.2; pulse 80. The patient seemed prostrated, and was rolling from side to side in apparent agony. The abdomen was normal in contour; not distended. There was epigastric tenderness, but no mass was felt. The chest was negative although he had a hacking cough with some expectoration. There were frequent cramps in the right arm and leg. I made a diagnosis of acute intestinal obstruction and advised immediate operation. This the patient refused at first but later consented and was taken to Macklin Hospital.

Operation.—The operation was performed by Dr. F. T. Eid, with my assistance, at 3 p.m. on November 10th. A midline incision was made in the upper abdomen. About 1½ feet of the upper part of the jejunum was intussuscepted into the stomach through the opening of a posterior gastro-entero-anastomosis. The intussusception was reduced by pressure from above through the wall of the stomach and careful traction. The intussuscepted part was dilated, thickened, congested and blue. It was treated with hot saline packings until the colour became pink and arterial pulsations came through. A fixation stitch was placed on the upper part of the jejunum and abdominal wall to prevent re-invasion. The abdomen was closed without drainage.

The patient made a good recovery and was discharged on December 8th.

Special Articles

SOME FACTS ABOUT THE CANADIAN MEDICAL ASSOCIATION

PREPARED BY

T. C. ROUTLEY, M.B.,

*General Secretary, Canadian Medical Association,
Toronto*

THE Canadian Medical Association was founded in 1867, the year of Confederation. The organization signalized an attempt to develop a national esprit de corps among the medical men of the new Dominion of Canada.

Since its inception, the Association has failed on two occasions only to hold annual meetings. These meetings have been moved about from East to West and from West to East, throughout the past half-century, offering splendid opportunities to the profession in this very large country to become acquainted.

Seventeen years ago, the Association commenced publication of its own *Journal*. Before this venture had become firmly established, the great war was upon us. Then followed four lean years for the Canadian Medical Association, as the energies, efforts and interests of the profession were centred, naturally, upon the duty of the hour. Following the war and the return to practice of hundreds of our colleagues, the Association attempted to rehabilitate itself. The outlook was not too bright. During the war period, while the revenue was greatly diminished, printing and other costs continued to roll up a deficit. In 1921, we found ourselves at the cross roads, demanding a definite decision. We must either adopt an aggressive forward policy, or disband. At this time, we had a little over one thousand members, paying an annual fee of \$5.00. Our deficit was close upon \$18,000. Our assets were practically nil.

At the Halifax meeting of that year, the Council decided that the Association would go forward; and the members present endorsed this sentiment by unanimously agreeing to double the annual fee and to raise, by bond subscription, a sufficient sum of money to liquidate our indebtedness. The year 1921 will be recorded in history, in so far as the Canadian Medical Association is concerned, as the mile stone which marked the road

toward a steady upward climb. During the past six years, the membership has increased to close upon 4,000. A liability of \$18,000 has been wiped out, leaving us a credit balance approximating \$25,000. Our budget in 1921 did not exceed \$20,000. Our budget in 1928, was considerably over \$100,000.

Year by year, practitioners in increasing numbers are inquiring what the Canadian Medical Association stands for, and are asking what advantages it offers to the man in practice. Probably this can best be answered by outlining some of our activities:—

JOURNAL

The *Canadian Medical Association Journal*, a monthly publication, is recognized to-day, not only in Canada but in all of the English speaking world, as one of the finest medical periodicals extant.

The *Journal* endeavours to publish the best in medical work and thought emanating from the profession in Canada. Furthermore, it attempts to keep the profession in Canada in touch with all medical news of national interest.

The *Journal* alone is worth \$10.00 per year, which is our annual membership fee. Because this splendid publication exists, the medical profession in Canada occupies in the minds of the medical world a higher position than would otherwise obtain. The *Journal* is the one great medium which stimulates better medicine in Canada, and, further, keeps the world in touch with what Canadian medicine is accomplishing.

EDUCATION

Every broad-minded practitioner of medicine realizes the importance of a progressive policy of medical education. The doctor who allows his mental equipment to stand still, stagnates. Each decade sees so many contributions made to medical learning and achievement that it behooves the man in practice to keep constantly on the alert for new ideas, improved methods and approved helps. Realizing the importance of all these facts, the Canadian Medical Association has endeavoured to assist organized medicine throughout Canada in furthering post-graduate study. To local medical groups, district meetings and Provincial Associations, from coast to coast,

the Canadian Medical Association has sent teachers of medicine. During the past three years, the sum of \$90,000 has been expended in this work, thanks to the munificence of one of our great financial institutions, the Sun Life Assurance Company of Canada. The following table presents a picture unequalled in any English speaking country in the world:—

	1926	1927	1928
Number of Speakers	169	269	329
Number of Addresses	513	729	802
Average Attendance			
per Lecture.....	29	27	31.7
Total Attendance...	17,264	19,683	25,423
Total Cost.....	\$30,100.27	\$28,831.66	\$33,336.45
Cost per Lecture per			
Doctor.....	1.74	1.46	1.31

Just here, it gives us great pleasure to announce that the Sun Life Assurance Company has made us a fourth grant of \$30,000 to carry on extra-mural work for another year.

Every Provincial Medical Association in Canada has expressed its great appreciation of our post-graduate efforts. Hundreds of practitioners have spoken in praise of this splendid type of service.

The Canadian Medical Association is the only nationally organized medical association in the world carrying out such an ambitious and extensive extra-mural post-graduate program.

LEGISLATION

By establishing a clearing house of information on Medical Legislation, as it exists not only in the Provinces of Canada, but in other parts of the world, the Canadian Medical Association offers a service to all of the Provinces whenever adverse medical legislation is threatened, or whenever an aggressive policy for improved medical legislation is desired. We have been able to assist more than one Province in its legislative efforts.

ORGANIZATION

The central staff of the Canadian Medical Association is available to all of the provinces to assist in the organization of District and Local Medical Societies. This service has been used by several of the provinces to the advantage, it is believed, of organized medicine, both locally and nationally.

MEDICAL SERVICE BUREAU

During the past five years, our Placement Department has been utilized by more than 800 physicians. This service is open to every member

of the Association who either desires to sell his practice or secure an assistant or locum tenens; or, on the other hand, to the young practitioner who is seeking a location. The Department is one of great value and is being increasingly used from year to year.

ECONOMICS

In the field of economics—the financial side of our professional life—the Association has been very active. Information has been gathered from and returned to the various provinces dealing with such matters as health insurance, lodge and contract practice, charity work, etc., etc., all of which we believe to be of interest and value to the practising physician. The Canadian Medical Association urged the federal Income Tax authorities to increase the tax-free allowance per dependent child from \$300 to \$500. This amount was finally allowed.

GOVERNMENT RECOGNITION

When it was learned that the medical superintendents in certain government hospitals were likely to be replaced by lay superintendents, the Canadian Medical Association let its voice be heard at Ottawa. That was a matter of several years ago. These hospitals are still in charge of medical superintendents.

Several years ago, the Federal Government, through its Department of Vocational Training, was subsidizing returned soldiers who were taking courses in chiropraxy. The Canadian Medical Association vigorously protested and the policy was immediately discontinued.

At our last annual meeting, a representative of the Department of Health, Canada, upon invitation, sat in to meetings of our Council. Subsequently, an invitation was extended to the Department to appoint an official delegate to Council. We are pleased to report that the Government acted upon our request, and, in future, will be represented in the deliberations of our Association.

HOSPITAL SERVICE

Realizing the close relationship which must ever exist between the medical profession and the hospitals of Canada, the Association inaugurated, during the past year, a Department of Hospital Service, with a full time medical officer in charge. This was made possible by the Sun Life Assurance Company again coming to our assistance with an annual grant of \$15,000. It is the purpose of the

Department to assist all hospitals in Canada, particularly the smaller ones, which may desire advice or information relative to the many problems associated with their work. Judging by the activity of the Department during its first year, a very bright and promising future will attend its efforts.

CANADIAN COLLEGE OF PHYSICIANS AND SURGEONS

During the past several years, a great deal of time and thought has been devoted to the development of a plan looking to the formation of a College or Colleges of Physicians and Surgeons in Canada, organized to conduct examinations and give diplomas to those members of the profession in our own country who are desirous of obtaining special qualifications in various branches of the profession. A Bill providing for the formation of the college will be presented at the next session of the Federal Parliament. The situation has been canvassed very thoroughly and every indication points to a successful culmination of the efforts of the committee in charge.

INTER-RELATIONS

Through a very active Inter-Relations Committee, there has developed, during the past few years, a much improved spirit of co-operation, not only between the profession in the various provinces but in our contact as a profession with the general public of Canada. To such an extent has this developed that Canadian Clubs, Service Clubs, Boards of Trade, Chambers of Commerce, Government Boards, and in fact all other organized branches of society, to-day recognize the Canadian Medical Association as the spokesman of organized medicine in Canada. This permits not only of real service, but also provides the medical profession in Canada with a very forceful and virile relationship which, obviously, offers many advantages.

WORKMEN'S COMPENSATION

Many of the Provinces in Canada have Workmen's Compensation Legislation which provides compensation for the accidents incident to industry. It has been found necessary to approach these various Boards to bring about a closer co-operation between them, particularly in reference to the overlapping of provincial activities at their boundaries.

PHARMACY

The physician naturally hopes and expects that the drugs which he uses in his practice are as pure and as potent as it is possible to make them. Unfortunately, the physician in the great majority of instances, is not in a position to judge whether or not a drug is what it purports to be. Realizing the national importance of this problem, the Canadian Medical Association advised the Federal Department of Health that standardization of drugs, both chemical and biological, should be a duty of the Government. We are glad to say that the Government frankly admitted the validity of our contentions, and have, for the past four years, been developing a department whose duty it is to determine that all drugs being utilized in Canada are what they should be. This is real practical service both to the medical profession and the public.

It is, further, very interesting to note that, thanks to the representations of the Canadian Medical Association, an invitation was extended to Canada to appoint a representative on the British Committee charged with the responsibility of revising the British Pharmacopœia. In the report just issued, Canada's representations are given prominence.

MEDICAL ETHICS

It sometimes happens that a member of the Canadian Medical Association may be accused of unethical conduct. The Association has machinery available to investigate such charges. If the charge be proved, censure is voted. If it be disproved, the physician so charged is honourably vindicated.

Although we enthuse over this Department in the inverse ratio to the amount of work it may have to do, yet, we recognize it as a protection both to our members and to the public.

IMPERIAL RELATIONS

The Canadian Medical Association became affiliated with the British Medical Association in 1924. In 1926, we were distinctly honoured in having His Royal Highness, the Prince of Wales, graciously consent to act as our Patron.

Members of the Canadian Medical Association receive the *British Medical Association Journal* at a special rate. Any of our members who go to the British Isles and present credentials from the Canadian Medical Association are most heartily welcomed by the officials of the British Medical Association. Those who have taken advantage

of letters of introduction have reported, upon their return home, on the great kindness accorded them in England, and the splendid manner in which they were put in touch with the work they desired to see or do.

In further reference to our imperial relations, two Committees, one in Britain and one in Canada, have been working for some time upon a plan which would facilitate the conditions by which Canadians desiring to take advanced British diplomas might do so. It is with great pleasure that we now report the completion of arrangements whereby the primary examination for the Fellowship of the Royal College of Surgeons of England will be held in Canada in the summer of 1929. This will be the first occasion in the history of the Royal College of Surgeons for the examination to be conducted outside of the British Isles.

In August, 1930, the British Medical Association will hold its ninety-eighth annual meeting in the City of Winnipeg, this being the third time that the British Medical Association will have met outside the British Isles, and on all three occasions, in Canada.

PERIODIC HEALTH EXAMINATIONS

During the past few years, increasing attention has been given, both by the profession and the laity, to the value of periodic health examinations. Believing that it is the duty of organized medicine to give leadership to this progressive policy, the Canadian Medical Association has prepared and there has been issued through the Department of Health of Canada, a manual for the guidance of physicians desiring to do periodic health examinations. Throughout the past year, negotiations have been carried on with the Life Insurance Officers Association of Canada, looking to the formation of a Department in the Canadian Medical Association to co-operate with the Insurance Companies in carrying out periodic health examinations of certain groups of policy holders. Possibly, the plan can best be presented by quoting from the report of the Public Health Committee of the Canadian Life Insurance Officers Association, which report was approved by the Association in annual session assembled in Toronto, on November 16th, 1928. Extracts from the report follow:—

"For some time, the Canadian Medical Association has been working on a plan to ensure more satisfactory results in the case of health examinations, and are now prepared to serve those

Insurance Companies who may desire to have their policy holders, or certain classes of them, granted free health examinations. It may be well to recount the steps that have, so far, been taken.

1. A book of instructions has been prepared by the Association and published by the Dominion Government which gives direction as to the manner in which the examination should be made.

2. An Examination Blank has been prepared and endorsed by the Association, which is moderate in its scope and yet covers what is thought to be essential.

3. The Local Medical Associations throughout Canada have been visited, have all endorsed the steps that have so far been taken, and are apparently willing to give the best possible service in connection with this work.

4. Details of operation have been fully discussed. Your committee has pointed out to the Medical Association the desirability of relieving itself as much as possible of clerical work, in order that the overhead may be reduced to a minimum. The Medical Association felt that a fee of \$6.00 would be necessary, but by transferring some of the contemplated work to the offices of the individual Companies, it is hoped to make a fee of \$5.00 cover the requirements—\$4.00 to be for the actual examination, and \$1.00 for expense incurred by the Medical Association itself. It is proposed that the Companies who may adopt the scheme send out the first letter from their own offices and request that further correspondence pertaining to the examination should be directed to the office of the Canadian Medical Association in Toronto.

In sending in his name, the policyholder is to be asked to give the name of his family physician or of some physician in his neighbourhood, as his choice for the examination. The Medical Association then undertakes to follow up such requests, bring the policyholder and the doctor together, see that the policyholder is given a thorough examination and such advice as may be called for by his condition.

Some of the advantages of this arrangement are that the policyholder will be examined by his own physician; that follow-up work will be much more likely and much more thorough than under any other system; that the urge from the Medical Association upon the doctors will be much more effective than from the Companies, both as to the quality of the examination and the effort to see that the examination is completed. Finally, the Association undertakes to do all in its power to make every physician familiar with the requirements of a health examination, and by printed instructions and addresses at association meetings, to emphasize the importance of the utmost care in endeavouring to discover incipient disease and especially warn policyholders of mature years as to what steps it is necessary to take to avoid the ravages of degenerative diseases.

At the outset, the committee feels that the

emphasis should be placed on policies of reasonably large amounts and particularly on policies where the age exceeds 45. The limitation is suggested because of the probability that, under the scheme proposed, a much larger percentage of policyholders to whom the offer is made will accept than has heretofore been the experience, and that the Companies should guard against the expenditure being made amongst classes of policyholders where the least benefit is likely to result, or where the premium is insufficient to reasonably bear the cost of the examination."

Following the adoption of the report, one Company immediately decided to take advantage of the plan. We have every reason to believe that, in the course of the next few months, several of the leading Insurance Companies of Canada will have entered into a contract with us for the services indicated.

SUMMARY

WHY SHOULD I JOIN THE CANADIAN MEDICAL ASSOCIATION? This article has attempted to answer that question. What has been accomplished to date must surely be a challenge to every progressive medical practitioner in Canada to throw in his lot with the Canadian Medical Association. If you are not a member, may we take this opportunity of urging you to join now?

HEREDITARY PECULIARITIES OF THE KINAESTHETIC SENSE

By MADGE T. MACKLIN, M.D.,

London, Ont.

At a meeting of the American Eugenics Association, held in Battle Creek, Jan. 2nd and 3rd., Dr. Grace Fernald, of Los Angeles, reported a very interesting series of cases. The children in question are unable to read or write or to do arithmetic when taught by the ordinary visual methods. They cannot learn the word "dog" by seeing it written on the board; they must learn to read it by being first taught the motion of writing it. Until this peculiarity was discovered, they were considered feeble minded, inasmuch as they never progressed past the first grade. Once having found the method by which they can be taught to read, Dr. Fernald demonstrated that they are for the most part superior in intelligence, some of the children making as many as five grades in five months after they came into her classes. They are particularly apt in mathematics and can solve problems in their heads with ease and speed—problems whose solution has to be verified by the teachers with paper and pencil. All of 50 cases were in boys. In 17 cases the father had the same inability to

read and write. Two of the fathers were wealthy business men in Los Angeles, who had to depend upon their stenographers to read their letters to them. In one case only was the condition inherited from the mother. These cases are not rare, and are worth remembering when the physician or teacher encounters a child who is unable to learn to read or write, but who does not appear to be feeble-minded in other ways. Several of Dr. Fernald's pupils had been certified by the physician as fit inmates for an institution for the feeble-minded.

THE QUEEN AND THE NATION

"In her message to the Lord Mayor of London on New Year's Day the Queen told, in simple but moving language, how the love and affection extended to her and to her children throughout the dark days of the King's illness have supported and encouraged her. For all their Majesties' subjects it has been a testing time, a time for steady nerves and for a brave front, and neither can be securely based upon ignorance. So it has come about that the public has sought assurance and has never failed to find it in the full and accurate information about the King's condition which has been given day by day and week by week. From the beginning the nation has known the worst; but it has also known the best. The report of progress which the King's doctors sent last Thursday to the medical press is a further manifestation of the confidence so wisely reposed in the nation by the Queen and her advisers. It carries a stage farther the story of his Majesty's gallant fight with his illness. The sober words reflect the spirit of the Queen's message, and they should discourage the irresponsible utterances of laymen, including those upon whom responsible office in the State imposes a special gravity of speech. Further they should serve to discount much of the gratuitous advice which has been offered to the physicians attending the King. The new medical report makes abundantly clear with what diligence every avenue of treatment has been explored by the King's doctors, and with what discretion the choice has been made by them between one form of therapy and another. The King is suffering now from weariness of body and mind, and his doctors are faced with the difficult work of overcoming it. Even nourishment must be given by a nurse using a feeding-cup, and the choice of suitable nourishment is limited. But 'the will of the King to live is there.' That brave attitude, combined with such favourable symptoms as now manifest themselves, emboldens the doctors, in their present anxiety, to declare that 'improvement and progress are taking place slowly but surely enough to justify the hope that the King will be restored to his people.'"—*The Times*, Jan. 10, 1929.

Editorial

FURTHER PROGRESS OF THE KING'S ILLNESS

IT is now about eleven weeks since the King became ill. The forecast that the illness would be prolonged and tedious has been fully borne out. Since our last writing it has developed that the infection, which at first was attributed to a "coccus," was due to the streptococcus. This, of course, explains why it was that the disease did not conform to the type of ordinary pleuropneumonia, and why the clinical picture was that of a severe septicæmia and toxæmia, with cyanosis, dry cracked tongue, delirium, subsultus, and exhaustion, eventuating in empyæma. Loss of weight has been marked; the blood pressure fell too low, and the blood became deficient in calcium. The administration of strychnine, calcium, and parathyroid substance was begun, with apparently beneficial results, and the ultra-violet ray

was used for its tonic effects. As an index of the amount of progress the red blood cell count may be cited. At the beginning of the illness the cells were as low as 2,900,000 but by the beginning of January had risen to 4,300,000. The propriety or otherwise of employing blood transfusion was considered fully, but, fortunately, this procedure was not found necessary.

His Majesty's progress is now such as to fully justify the belief that his restoration to health is merely a matter of time. All are rejoiced that the period of grave anxiety has now passed. While his improvement has been slow it has been steady. It is now expected that he will be removed to Bognor in Sussex, to recuperate, so soon as conditions warrant it.

A.G.N.

AN EARLY PIONEER IN ANÆSTHESIA

IN a recent issue of the *Lancet** the attention of the profession is again called to the pathetic story of Henry Hill Hickman, a young English surgeon who died in 1829 at the early age of twenty-nine years, discouraged and broken hearted over the reception of his efforts to interest the profession in the possibility of inducing insensibility to pain during operative surgery by the introduction of certain gases into the lungs.

We are chiefly indebted to Dr. C. J. S. Thompson†, for many years curator of the Wellcome Historical Medical Museum, who, in an article which appeared in the *British Medical Journal*, gave to the profession the story of the persevering researches of this young surgeon.

Born in the year 1800, Henry Hill Hickman had hardly reached his majority when he qualified as a member of the Royal College of Surgeons and began his career in the

village of Ludlow, in Shropshire, England. He had been strongly impressed by the terrible sufferings of those whom he had seen undergoing surgical operations, and being of a very sensitive and sympathetic nature himself, he resolved to devise some plan of alleviating pain by rendering patients unconscious before an operation. With this object in view he commenced a series of experiments on animals by first producing semi-asphyxiation by the exclusion of atmospheric air, and then making them inhale small quantities of carbonic dioxide. While they were thus unconscious he found he was able to excise ears, amputate legs, and perform rapidly other surgical operations without any apparent suffering. The animals quickly recovered consciousness and the wounds healed rapidly. Later on, he used, instead of carbonic dioxide, nitrous oxide gas. These experiments he carried on for some time with considerable success, a success which convinced him that, could he but carry out his

* 2: 1195, December 8th, 1928.

† 1: 843, 1912.

experiments on the human subject, he would be able to render painless the performance of a major surgical operation. His notes on some of these interesting experiments are still extant in his own handwriting, and are quoted by Dr. Thompson in his paper in the *British Medical Journal*. So encouraged was he by his success in these experiments that he removed to the larger town of Shifnall and endeavoured to demonstrate his results before his professional brethren, but his statements were met with scepticism, and his attempts were condemned as dangerous and useless; even the medical press of the time refused to publish the results of his experiments.

So convinced was he of the possibility of inducing a state of unconsciousness to pain by this gas that he wrote a letter describing his methods, and the results he had obtained, to a sympathetic layman, Mr. T. A. Knight, of Downton Castle, who published his letter in a pamphlet and had it distributed.

Disheartened by his failures to secure a hearing from the profession in his own country, Hickman resolved to present his experiments before the Royal Academy of Medicine in Paris, and drew up a memorial to King Charles X, praying for permission to perform his experiments before the leading medical men of that city. The receipt of this letter is recorded in the *National Archives* of France under the date of August 7th, 1828. His petition was referred by the King to the Royal Academy of Medicine, and its representative M. Gérardin, was appointed to deal with it. He brought it before a meeting of the Society on October 21st, and a committee was appointed to investigate Hickman's claims. In the minutes of the Academy, it is stated that Mons. Gérardin read a letter written to His Majesty Charles X by Mr. Hickman, a London surgeon, in which that gentleman asserted that he had discovered a means of performing troublesome and dangerous operations without pain; that he had made numerous experiments on animals with success and was desirous of obtaining the co-operation of the leading physicians and surgeons in Paris in order to make the same experiments on the human subject.

Although the reading of the letter caused a sensation, Hickman's statements were

received by the majority of the members with derision and contempt. His only defender was Baron Larrey, a distinguished military surgeon, who offered himself to be experimented upon. No further steps, however, were taken, and the demonstration was allowed to drop.

Discouraged and well-nigh broken-hearted he returned to England to die a few months afterwards. With his death the valuable knowledge derived from his experiments that insensibility to pain could be induced by inhalation of nitrous oxide was forgotten. No further notice or attempts to relieve the sufferings of those operated upon was made until October, 1846, memorable as the date when, in the Massachusetts General Hospital, the first surgical operation was performed on a patient under the influence of ether. This demonstration was speedily followed by a similar use of ether as an anæsthetic inhalant in an operation performed in December of the same year by Robert Liston in University College Hospital, London.

In the fierce controversy that followed in the medical press of that period as to who was the first to suggest inhalation as a method of producing anæsthesia, no mention was made of Hickman until his friend Dr. Thomas Dudley wrote a letter to the *Lancet* on February 6th, 1847, in which he called attention to Hickman's discovery of anæsthesia by inhalation and his endeavours to place its possibilities before the profession. Writing to Mrs. Hickman shortly afterwards, Dr. Dudley expressed his opinion as follows: "I consider that Dr. Hickman is clearly entitled to the claim of having originated the idea, and had his work been published in more liberal times his idea would have been followed up;" adding later on, "It is clear that the discovery of the principle is his."

Another important reference to Hickman as being the first discoverer of the principle may be found in the official report of the meeting of the Royal Academy of Medicine in Paris on February 23rd, 1847, where it is recorded that after the reading of a letter from Dr. Wells, of Connecticut, U.S.A., claiming the merit of the first application of the method of inhalation of an anæsthetic gas in surgical operations, Mons. Gérardin stated that fifteen or eighteen years pre-

viously a letter had been received from an English physician who asserted that by inhalation of nitrous oxide gas he could render patients insensible to pain during surgical operations. The letter had caused a sensation in the Academy, as many members treated it with contempt, but Baron Larrey defended it. The *Medical Times* of July 31st, 1847, commenting on the various claimants to the discovery of anæsthesia by inhalation, states: "We think, however, we can set these various claims at rest by the extract from the printed reports of the Academy of Medicine, of Paris, which has been quoted above," adding "This passage is sufficiently explicit; no doubt can be entertained that the principle was discovered by Mr. Hickman, and it is in the principle that the invention resides."

A hundred years have passed since Hickman placed his method of producing anæsthesia by inhalation before the Royal Academy of Medicine in Paris. And at

last his countrymen seek to do him honour. It is proposed to renew his tombstone, to place a memorial tablet in the parish church of the village where he was born and to procure a portrait for the Royal Society of Medicine, and if funds permit to establish a Hickman prize for original work in anæsthesia. A committee has been appointed with Lord Dawson as chairman, Sir Sinclair Thompson as vice-chairman, and among other members are the editors of the *British Medical Journal*, the *Lancet*, and Dr. Dudley Buxton. The fund will remain open until the end of January, and subscribers to it will then be consulted by the committee on the disposal of the fund. Subscriptions should be sent to the Honorary-Treasurer, Mr. V. Warren Low, 76 Harley Street, W.1. To this memorial we are sure that many anæsthetists both in Canada and the United States would be glad to contribute if a longer period were given during which contributions would be received.

A. D. B.

MATERNAL MORTALITY AND THE PRACTICE OF OBSTETRICS

THE function of the medical man is to save life, and there is a rapidly growing conviction that it is also his duty to prevent disease. Ever since the medical curriculum was lengthened, in the vain hope that the student might thereby be enabled to cope satisfactorily with the much enlarged field of medicine and thus develop into an improved type of practitioner, there have been heart-searchings among many of those interested in medical education as to whether the course of study which is usually provided, even in the highest type of college, is the best that can be devised for this purpose. Those who think it is not point to the overcrowded curriculum, the too great attention to detail, and the over-emphasis on laboratory technique, particularly in regard to the basic subjects, also to the lack of co-ordination that they think exists between the basic sciences and the clinical branches.

Looking back on one's own college days one sometimes wonders whether valuable time was not often wasted. Sitting at the back of a crowded amphitheatre while the

teacher was listening to a heart or was carrying out the details of a complicated operation did not seem to produce adequate results. The average theatre clinic, indeed, left much to be desired. In fact, it is clear that personal contact of the student with the case is the essential requisite.

Dr. H. M. Little, in an editorial appearing in the January issue of this journal, pointed out the inadequate amount of time allotted to instruction in obstetrics, and stated that the practical side of the subject should receive greater emphasis. A medical contributor to *The New Statesman* (31: 189, May 19, 1928), also, writing under the pseudonym of "Lens," makes a powerful plea for more and better teaching in obstetrics. He feels while all are agreed that more attention should be paid to the prevention of disease this does not necessarily mean that we should lengthen a course labelled "Public Health." As measures for the prevention of disease become more effective medicine and surgery will tend to become less important, but, unless birth-control becomes

universal, obstetrics is likely to be the only branch of medical practice that will be maintained for ever. Hence proper and adequate instruction in this subject is a paramount necessity. As "Lens" well remarks, "Good obstetrics, in a word, is preventive and creative practice of the first order. It has no equal. It saves the mother and it saves the race. It averts the disasters which later fill the gynaecological hospitals; it reduces the number of still-births and the rate of ante-natal mortality. Really good obstetrics begins ante-natally and becomes creative hygiene in its services to the nutrition of the unborn child." It has been established that next to medical ailments the most important branch of the average general practitioner's work is that concerned with obstetrics. Should he not then be trained with this fact in view? How good obstetrics may be preventive is well illustrated in connection with the association of cancer of the uterus with tears of the cervix. As all will admit, a minimum of laceration at the time of delivery is a consummation highly to be desired. On this point the Report of the Cancer Commission of the League of Nations for 1923 to 1927 reads as follows:

"The Commission can only lay stress upon the importance of the evidence that in general experience the occurrence of cancer of the cervix (of the uterus) is associated with conditions which are, at least in some measure, preventable by efficient management of labour—particularly in primiparae. It may well be that in all countries a consideration of current obstetrical methods from this point of view would constitute an important step towards the prevention of uterine cancer."

But how to get more time for the study of obstetrics during the college course? The surgeons will, doubtless, raise a cry of protest, but it may be suggested, humbly, that some of the time devoted to surgery might be better employed in giving more adequate practical instruction in obstetrics and gynaecology. Inasmuch as the ordinary general practitioner is not called upon to do major

surgery, except in rare cases, it may be suggested that the routine course in surgery should be confined to the consideration of minor surgery and the relatively few major operations which constitute the bulk of ordinary emergencies, such as those for appendicitis, hernia, or intestinal obstruction. More advanced instruction might be safely left until post-graduate days. Such an innovation as this would not be incompatible with sound instruction in the general principles of surgical diagnosis and technique, which, of course, is a *sine qua non*.

As is now well-known, maternal mortality in child-birth, in English-speaking countries, is much too high. It would be decidedly unfair to blame this upon the shortcomings of the medical man. Some of the causes responsible for it are not altogether remediable at the present time. Poverty, with its concomitants of dirt and bad housing; lack of ante-natal care of mothers; in this country, remoteness from hospital aids; and the insistence of mothers and their relatives and friends on the speedy termination of labour; all play a part. Better instruction of midwives and the greater enlightenment of the general public are clearly required. At the same time, the obligation remains to make the instruction provided in obstetrics and gynaecology adequate to meet the demands, and to turn out from our medical schools practitioners who will be even better prepared than formerly to deal with the common emergencies of medical life. It may be noted that the Association of Obstetricians, Gynaecologists, and Abdominal Surgeons in the United States has created a Board of Obstetrics and Gynaecology, with a view to certifying physicians who may be able to satisfy them of their competence, in the hope that this will stimulate the younger medical men to perfect their practice and maintain higher standards. This is all to the good. A.G.N.

RECENT WORK ON THE PITUITARY BODY

ONE by one the secrets of the endocrine glands are being wrested from them. The thyroid, the adrenal, the pancreas, the parathyroids have in turn been conquered, if not entirely, yet in large measure. Now the pituitary follows.

It has recently been announced that Dr. Oliver Kamm, Director of Chemical Research in the laboratories of Parke, Davis and Company, has been awarded the thousand dollar prize of the American Association for the Advancement of Science for "the most note-

worthy contribution to science" presented at the annual meeting. Dr. Kamm's work has been done in connection with the endocrine glands, and, notably, with the pituitary body. After twelve years of endeavour he has succeeded in isolating, in a great degree of purity, two hormones from the posterior lobe of this organ. The difficulty attendant on this particular research, and the amount of patience required, can be appreciated when it is stated that the pituitary glands of fifty thousand cattle were required to carry out one experiment. Consequently only a few grammes of the substances are on hand.

According to Swale Vincent,¹ no physiologically active substance can be extracted from the anterior lobe, save a depressor substance that is not specific but common to all tissues and organs. The specific substance, or substances, are derived from the posterior lobe. That they act on blood-pressure, respiration and unstriated muscle has long been known. That they have an action on the melanophores of the frog, causing darkening of the skin, is also known.

The suggestion that the posterior lobe of the pituitary body may elaborate more than one hormone is not, of course, new, but it is only of late that sufficient evidence has accumulated to make this idea certain. Abel and Macht² state that they have conclusive proof that there is present in the posterior lobe a substance which readily yields histamine on treatment with acids, and note the possibility that this substance may be present in two forms, free and combined. Schäfer and Herring thought that two active principles existed in pituitary extracts, one acting on the circulatory system, the other, specifically, on the kidney. Beyer and Peter distinguished two separate substances, one being a sympathetic inhibitor, the other an autonomic augmentor, which exerted their action on the bowel. Fühner isolated a crystalline basic substance which in the form of a sulphate, was placed on the market under the name "hypophysin." This, it

has been stated, consisted of four separate substances. Fühner and Schickele believed that the substance acting on the uterus is different from that affecting blood-pressure. An important step forward was made by Dreyer and Clark³, who found that the melanophore and uterine stimulants of the pituitary body could be partially separated by ultrafiltration through collodion sacs. They thought that the two actions concerned are produced by different and separable active principles. They also stated that it is probable that the vasoconstrictor substance is not the same as the oxytocic substance.

Dr. Kamm has succeeded in isolating, in a great degree of purity, two separate hormones from the posterior lobe of the pituitary body, which he calls alpha and beta. The former is oxytocic; the latter raises blood-pressure. The beta hormone also has the power of controlling the excessive elimination of water. He thinks that the so-called "renal action" of pituitary extracts does not exist; that the beta hormone does not act on the kidneys directly, but controls the utilization of water by the individual tissues. Further investigations in regard to the usefulness of beta hormone in those pathological conditions associated with excessive loss of water are still in progress.

It may be hoped that the additional light thus obtained will lead to a notable addition to our remedial agents. The dangerous symptoms found in such conditions as, diabetes insipidus, burns, cholera, certain infections, and that sometimes follow anaesthesia, are in the main attributable to dehydration of the tissues. It may prove that beta hormone, by favouring retention of water in the tissues, may turn out to be a life-saver in these cases.

A.G.N

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ON THE TREATMENT OF VARICOSE ULCERATION

IN May 1926, the Ministry of Health submitted to the British Medical Association a scheme for collective research, and at their next meeting the Council of the Association appointed a special research committee to consider the proposals suggested. Eventually it was decided to initiate two concurrent enquiries, one into the treatment of varicose ulceration, and the other into the after history of patients who had undergone the operation of gastroenterostomy. The first enquiry has now been completed and the report, correlated by Dr. A. P. Luff, consulting surgeon to St. Mary's Hospital, appears in a recent issue of the *Journal*.

Varicose ulceration is recognized not only as a condition frequently met with, but one which gives rise to much discomfort and often pain, and is responsible for a great deal of disability, especially among women; its treatment is tedious, the results are often disappointing, and relapses are common. One of the most interesting points brought out by the enquiry was the great variety of methods employed at the present day for the alleviation and cure of this well defined and common condition. The report, as prepared by Dr. Luff has established the value of a collective investigation of this kind as an important branch of practical, as opposed to academic research. Reports of 1,092 cases were received; of these 33.7 were males, 66.3 were females. In the majority of cases the ulceration commenced between 30 and 50 years of age. Of the total number

61 per cent were engaged in domestic work; 32 per cent were in occupations involving prolonged standing. Only a very small percentage, about 7 per cent, was met with among farm workers and gardeners, although on many occasions their occupations involved long standing, thus indicating the counter-acting effect of constant muscular exercise in the open air. Of the total number of cases 70 per cent were healed, but in all of these rest for a varying period in bed, or its equivalent, has an important influence on the result. As the true varicose ulcer is the result of varicose veins it would appear that the rational method for the prevention of such ulceration is the obliteration of the affected vein or the removal of them by operation. Of these two procedures obliteration by injection would appear to be both safer and easier. Dr. Luff sums up the result of the investigation as follows.

In order to obtain the best results it is recommended that the medical practitioner limit his treatment for varicose ulceration to two procedures. The first is injection of the veins, in combination with the local use of Unna's zinc gelatine. The second is the use of Unna's zinc gelatine alone if injection is refused, combined with the employment of suitable bandages, applied in such a way that pressure may be permanent and even, and if possible with rest in bed. Treatment by ultra-violet rays appears in many instances to have been very valuable in the hands of an efficient radiologist. A.D.B.

THE TREATMENT OF ERYSIPELAS

WHY is it that the serum treatment of erysipelas has not been as successful as that of scarlet fever? It has been shown by Birkhaug that erysipelas is caused by a specific streptococcus. Why, then, has it not been possible to prepare from this organism a serum which will control the disease? Birkhaug himself claims very encouraging results from such a serum, but he has not received any very general support. McCann,* for example, used this serum in a

series of cases of erysipelas and compared the results with a parallel series of cases in which no serum was given. The comparison was not in favour of the serum. Not only was the mortality higher amongst those who received it, but the average duration of their illness was longer.

Another report by Symmers* arrives at rather more moderate conclusions. In his experience the serum did have the virtue of controlling the immediate attack in the

**J. Am. M. Ass.*, 91: 78, July 14, 1928.

**J. Am. M. Ass.*, 91: 535, Aug. 25, 1928.

majority of cases, but it conferred no immunity, and did not diminish the occurrence of complications. In addition, a small but definite number of cases were completely intractable, no matter how much or how often the serum was given.

Still more recently* it has been pointed out by T. Francis, Jr. that Birkhaug's serum cannot be expected to have the specific effect which is obtained from antiscarlatinal serum, because, although erysipelas may have a specific causal agent, the course of the disease from a laboratory standpoint is not exactly parallel with that of scarlet fever. There is a difference, according to Francis, between the cutaneous reactions produced by the toxins of the streptococci responsible for these two diseases. In the case of erysipelas the toxin of the specific streptococcus gives rise to its most definite local reaction in the skin only after the disease has passed the acute stage and convalescence has set in; whereas, in scarlet fever, as is well known, the cutaneous reaction to the toxin of the *S. scarlatinae* (as shown by the Dick test), becomes less marked with the progress of the infection, and when convalescence is

established disappears altogether. Another difference to which attention is called is that the blood during the acute stage of erysipelas seems to contain no toxins comparable with those that can be demonstrated during the corresponding stage in scarlet fever. Erysipelas is not a toxæmia in the sense that scarlet fever is. Again, the serum of patients convalescing from erysipelas possesses no such protective power as is found in that of scarlet fever. It is true that during the acute stage of erysipelas a substance is produced which neutralizes filtrates of the *S. erysipelatis*, but this does not correspond with the toxin of scarlet fever, since it does not give rise to antibodies.

It is with these differences in view that Francis concludes that attempts to treat erysipelas by means of an antitoxin is unlikely to meet with any marked success. He suggests rather that the streptococci of erysipelas set up by their growth in the erysipelatous lesion an allergy by means of which the final recovery is brought about. This is a theory which requires further support, but in the meantime his work is a serious criticism of the fundamental points underlying Birkhaug's views. H.E.M.

*J. Clin. Invest., 6: 221, Oct. 20, 1928.

A VACCINE FOR DISTEMPER

THIS disease, the terror of all dog lovers, would appear to be at last on the point of being conquered. An intensive study, made possible by the financial assistance of the Field and the Medical Research Council, appears to have yielded practical results*. The unusual difficulties inherent in the problem which hitherto have prevented investigators acquiring indisputable facts regarding either the etiology or the prophylaxis of this disease have apparently been overcome. Susceptible animals, which had not already had a mild attack and were consequently immune, have been obtained by breeding suitable dogs in an isolated compound, thus avoiding the chance of importing a carrier. Satisfactory isolation of the individual dogs investigated was achieved by securing each dog in a separate kennel with an efficient distance (15 to 20 yards) between each

The next advance was made when it was discovered that ferrets were susceptible to the same distemper virus as dogs, and that in them the disease ran a more uniform course and one fairly severe and almost invariably fatal. These animals, therefore, proved excellent as tests, and their blood and organs afforded fresh supplies of potent virus, effective in dogs and of a more uniform strength than a similar virus obtained from dogs.

With all the above conditions perfectly attained, it was possible to study the uncomplicated disease clinically. A temperature chart, with two waves of fever, was established as typical, but other symptoms were apt to be very variable. The nature of the primary infection was shown to be a filtrable virus and not any readily growing microbe such as the bacillus bronchi-septicus, as was thought to be the case by some previ-

* The Lancet p. 1250, Dec. 15, 1928.

ous investigators. Undoubtedly, however, bacteria readily become important secondary invaders. Very potent virus was found to be present in the blood from which no bacteria could be cultivated. Thus, Carré's claim which he made in 1905 that the virus was capable of passing through a filter which kept back bacteria was confirmed. A vaccine was first made from virus obtained from a ferret's spleen and rendered uninfected with formalin, and prepared in the same way as the vaccines which proved effective in rabies and in foot and mouth disease. This vaccine proved of distinct prophylactic value in ferrets but only of slight value in dogs. When, however, a formalised vaccine was prepared from the virulent lymph glands, spleen, and liver of a dog, it was found to afford very satisfactory prophylaxis. One dose of this vac-

cine prepared from dogs' tissues and followed by the inoculation of an attenuated strain of living virus was found capable of protecting dogs, whether they were tested by inoculation or by exposure to cases of distemper. A writer in the *Lancet* states that the vaccine has been used on 949 dogs under the care of 44 different veterinary surgeons in the last two and a half years with uniformly encouraging results. The experience of its use in two foxhound kennels may be cited. In one instance twelve couples were vaccinated and all escaped an attack, although they were exposed to infection in the kennels in which out of thirty-five unvaccinated couples eleven died. In other kennels 22 vaccinated couples had no illness, but of 45 unvaccinated couples 24 died. It is hoped that a serviceable therapeutic serum may shortly be available on the market.

A.D.B.

SECRETIN

ALTHOUGH secretin was the first endocrine secretion to be discovered—in 1902 by Bayliss and Starling, two great physiologists who have recently left us—and although its discoverers ascertained all the important facts concerning its function, which consists chiefly in the chemical stimulus of the pancreas whereby pancreatic juice is secreted, yet singularly little advance had been made in our chemical knowledge of secretin itself until Professor John Mellanby of St. Thomas's Hospital Medical School commenced to study it two or three years ago. He has recently published an important paper in the *Journal of Physiology*, in which his results, to date, are detailed.*

Every endocrine secretion appears to require its own special method of isolation. Mellanby extracted the duodenal mucosa with absolute alcohol, added bile salts to the extract, and precipitated the bile acids by dilute acetic acid. Secretin was precipitated with the bile acids. The wet precipitate was extracted with absolute alcohol. Secretin passed into solution and was reprecipitated by addition of excess of acetone. Then it was finally purified by dissolving it in water and once more precipitating by addition of dilute acetic acid.

Mellanby's preparation is an amorphous, pale-brown powder. He has not yet been able to obtain it in crystalline form, and its colour suggests that it is not completely pure. One hundred thousand parts by weight of duodenal mucosa yield three parts of the powder. It is a polypeptide containing radicals of the amino-acids tyrosine and histidine, and of some compound containing phosphorus, and also a trace of sulphur (perhaps due to cystine radicals). Probably many other radicals are present. It dissolves slowly in water, more readily in very dilute alkali, and is insoluble in dilute acid, acetone, ether, and absolute alcohol. It is rapidly hydrolysed by dilute acid and alkali at 100° and by pepsin, trypsin, and tissue protease at 38° C.

Intravenous injections of solutions of this powder produce the typical functional actions of secretin on the pancreas and liver, and a maximum flow of pancreatic juice and of bile results when the concentration of this powder in blood is as low as one part in five millions. At this concentration no other physiological effects are detectable. When stronger solutions are injected subcutaneously a slight flow of pancreatic juice follows.

The complex nature of insulin was referred to in a recent editorial. It is becoming

* *J. Physiol.*, 66: 1, 1928.

evident that there are at least two distinct classes of endocrine compounds. Each member of each class probably is itself of distinct chemical type. One class is relatively simple in composition, and is represented by thyroxine, an amino-acid, and adrenine, a

secondary amine. Members of the other class have vastly more complex molecules, exemplified by insulin, a proteose, and secretin, a complex polypeptide and perhaps also a proteose.

A. T. CAMERON

Editorial Comments

THE ASSOCIATION

Attention is directed to page 173 of this issue on which appears a special article by the General Secretary, Dr. T. C. Routley, entitled "Some Facts about the Canadian Medical Association."

It is well for us to know what our Association stands for and what it is doing.

To those members who keep closely in touch with the Association's activities the article is encouraging and inspiring. To those who are content to "let George do it" this recital of some of the accomplishments of their Association will come as a revelation. It is written in a clear concise manner and emphasizes the high lights only, and "he who runs may read."

To all of us who firmly believe in the future of the Canadian Medical Association, and that this future should include as a member every physician in active practice in the Dominion, Dr. Routley's article supplies the ammunition and issues a challenge.

A.T.B.

THE EMPLOYMENT OF MORPHINE IN PNEUMONIA

The value of morphine in pneumonia is one of those medical problems in which theory, as represented by laboratory knowledge, can only be reconciled with practice by experience and the exercise of clinical judgment. Amongst the pharmacological actions of morphine there are depression of the respiratory centre, a tendency to distension of the bowel, and a certain degree of relaxation of the bronchial musculature. The fear of these obviously undesirable effects might well deter the practitioner from giving morphine to a patient suffering from pneumonia, but actually of course it does not. One has only to see the beneficial results of a small dose of morphine in a restless and suffering patient to realize that what is known of the pharmacological action of the drug must not be too rigidly interpreted if it is to be any guide in practice.

Some recent work by J. S. Davis, Jr.,* has thrown further light on the matter. The object of his experiments was to determine the effect of morphine on the respiratory movements and

the content of oxygen in the arterial blood of pneumonic patients. All observations were made on human beings, the greater number of whom were acutely ill with pneumonia; 33 cases in all were studied.

The net results of his observations was that in most cases of pneumonia the effect of morphine on the respiratory movements and on the proportion of oxygen in the arterial blood was slight. The extent to which respiration was depressed by the drug was not sufficient to serve as a contra-indication to its use, and the benefit it conferred by the relief of pain and the bringing of sleep undoubtedly outweighed possible ill effects from a slight reduction in pulmonary ventilation and increased anoxæmia.

It was found, however, that there are certain types of cases in which morphine may be definitely harmful. These, as might be expected, are the patients in whom there is extensive pulmonary involvement with much moisture. In these there is too small a margin to safely permit of any diminution in the capacity of the lung to aerate the blood, and morphine should only be administered to them with the greatest caution and in combination with oxygen therapy.

It comes to this, therefore, that morphine may be safely used and has great value in relieving restlessness and giving sleep at a time when it is a boon above all others, when it is "beloved sleep" indeed. But how much it should be used in the severer cases must be decided by that combination of experience and common sense which we call clinical judgment.

H.E.M.

THE LIVER TREATMENT OF PERNICIOUS ANÆMIA

In a recent editorial the *British Medical Journal*¹ calls attention to the remarkable change which has taken place in the prognosis of pernicious anæmia. Two years ago, to make a diagnosis of this disease implied almost inevitably speedy death, while to-day there is probably no disease in which one can so confidently promise rapid recovery. Some degree of caution is perhaps still necessary in speaking of the permanence of the cure, but thus far the uniform and widespread success of the treatment justifies the hope that the gratifying results obtained at

* *Jour. Clin. Inv.* 6: 187, October, 1928.

present may persist for many years and in the end not disappoint us. There are however some who still advise caution. Price-Jones at the summer meeting of the Pathological Society of Great Britain and Ireland stated that even after the apparent return of the blood to normal there was still to be found present in the blood stream a considerable excess of the megalocytes. A similar observation appears in a recent paper by Davidson and Macrie.² Nevertheless, as Price-Jones recognized in his address, available data as to the size of cells in normal and healthy individuals are as yet too incomplete to enable us to draw any final conclusions in the matter. From experience already gained we know that once the anæmia has disappeared the amount of liver which the patient still requires to take varies greatly with the individual; in some it may be reduced considerably, but in others any diminution is followed by signs of deterioration in the blood and severe relapse has occurred in patients who have abandoned the liver diet altogether.

With the wonderful success now obtainable in the treatment of the disease interest has largely passed to the further study of the etiology and pathology of the condition. No new theory of its causation has yet been established but several theories have been overthrown. The conception of a primary hæmolytic lesion is gradually being discarded; and those who considered some intoxication arising in the alimentary canal as an essential etiological factor have been forced to the view that such toxin acts either by interfering with the liver function by preventing the formation of some substance which is essential to the final development of the red cells, or by inflicting direct damage upon the patient's bone-marrow.

The results obtainable from liver treatment may also be valuable in the diagnosis of the disease. Minot quite early in his work suggested that any failure to respond to liver treatment was to be taken as an indication that the patient was not suffering from pernicious anæmia. A careful review of a large series of cases goes far to confirm Minot's suggestion, for it is found that in cases which prove refractory to the liver treatment some other diagnosis would appear to be probable. On the other hand, patients in whom some symptom regarded as almost pathognomonic is absent may perhaps with more certainty be regarded as in the class of pernicious anæmia, if they show a characteristic response to liver therapy.

The same editorial in calling attention to the number of liver extracts which have been put on the market states that insofar as the results are

open to accurate measurement, no superiority of whole liver over well prepared liver extract has been demonstrated. Furthermore, another writer calls attention to the remarkable increase in weight that takes place in patients on liver diet, and often with great rapidity. It may be questioned however whether this has anything to do with the special disease or whether it is not, rather, a wholly independent phenomenon.

A.D.B.

REFERENCES

1. *Brit. M. J.* 2: 1147, Dec. 22, 1928.
2. *Lancet* 2: 1014, Nov. 17, 1928.

PARASITES IN STREET DUST

The *Journal of the Medical Association of South Africa* for November 10, 1928, contains an interesting account, by Dr. Annie Porter, of some observations on the distribution of animal parasites in street dust. This investigation has been carried on since June, 1923, by the examination of samples of street dust collected from various parts of the city of Johannesburg. The dust was obtained from the roadway and gutters direct and not from the filtering of air, the intention being to gain some idea of the part played by wind in scattering this type of infection.

The list of parasites found in the various samples of dust examined (150 in all) includes many forms which are pathogenic for man. No far-reaching generalization is made, but Dr. Porter points out that their number and variety are a little disconcerting as occurring in the street dust of the largest city of the Union of South Africa.

It would be interesting to have similar investigations made of the dust of any large Canadian city, not with the idea of drawing any comparisons, but in order to strengthen the hands of health authorities in keeping cities clean.

H.E.M.

As we go to press we learn with regret of the death from pneumonia of Dr. F. H. Mewburn, Professor of Surgery of the University of Alberta. A full notice will appear in the March number.

A CORRECTION

In our editorial comment for January last reference was made to an editorial in the *Bulletin of the British Columbia Medical Association*. This was an error. The Bulletin in question is published by the Vancouver Medical Association.

H.E.M.

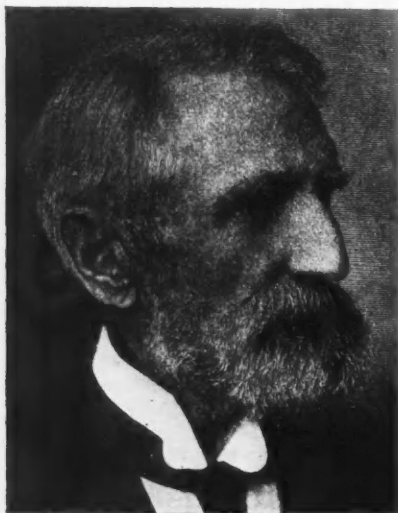
Men and Books

A SHORT SKETCH OF MEDICAL PROGRESS IN ALBERTA*

BY HEBER C. JAMIESON, M.B.

Edmonton

Twenty-three years ago Alberta became a province. In its short existence it has made a medical record worthy of notice. The profession has contributed an ambassador to France and two lieutenant-governors to the province. The University has developed a medical faculty to a Class A standing and now graduates its own students. A member of its staff shared in the Nobel Prize for 1923 and in 1924 discovered the hormone of the parathyroid gland. During the World War a Field Hospital was organized and saw service. Almost 100 medical men enlisted in the C.A.M.C. or R.A.M.C. Previous to 1872 there was only one medical man in the North West Territories. Dr. W. M. Mackay, a graduate of Edinburgh arrived at York Factory on Hudson Bay in 1864 to serve as surgeon to the great Company of Adventurers. Three years later he became a factor. For thirty-four years he travelled by York boat and dog-train through the vast country west of the Bay. Half of this time was spent in the Athabaska and Peace River districts.



Dr. W. M. Mackay

The first medical practitioner in the North West Territories. Photograph kindly loaned by Mrs. W. M. Mackay, Edmonton.

* Presented with the menu of the annual banquet, September 18, 1928, by the Edmonton Academy of Medicine.

Retiring to Edmonton in 1898 Dr. Mackay became in 1902 the first president of the newly formed North Alberta Medical Association. He died in 1916. Mrs. Mackay and several children are living in Edmonton.

In 1872 Dr. Verey accompanied David McDougall from Fort Garry to Edmonton. He spent the winter in the Fort and then moved to Morley where he assisted in teaching the Indian children and giving his medical services when called upon. After two years he returned to Edmonton, where he married. He built a house on the flats, now used as the Municipal Golf Links. Here he died, leaving a widow, who is still living, and four children.

Before this, four medical men visited the future province. Dr. John Richardson, who accompanied Sir John Franklin on his overland journey to the Polar Sea, visited Fort Edmonton in 1820, and commented in his diary on the amount of goitre there present. In 1867, Dr. Hector, medical officer with the Palliser expedition, came from Winnipeg to Fort Edmonton and then went by way of old Bow Fort into the Rockies and discovered the Kicking Horse Pass, whose name commemorates an accident to himself. Dr. Cheadle, another English surgeon, came with Lord Milton and after traversing the great plains made his way through the Yellowhead Pass and on to the coast. The original survey for the Canadian Pacific Railway was through this pass and then down the North Thompson River. With Sir Sanford Fleming, who chose this route which is now used by the Canadian National Railway, was Dr. Arthur Moren, of Halifax.

Smallpox, in 1870, was so widespread among the Crees and Blackfeet that the Lieutenant-Governor of the Territories appointed Captain (later Sir) W. F. Butler to estimate the extent of the epidemic and to suggest a means of dealing with it. It was found at St. Albert, which had a population of about 1,000, mostly half-breeds, that nearly 300 had died. A Board of Health was appointed and was the first organized form of local government to be established in the future province. This Board was composed of Roman Catholic Bishops and Priests, including Father Ledue; Protestant Missionaries, of whom John McDougall was one; and Richard Hardisty, Chief Factor at Fort Edmonton.

The main industry of the western part of the Territories was fur trading and this was in the hands of the Hudson's Bay Co., and it was conducted in an honest and straightforward manner with the Indians. In the seventies numerous traders began to cross the boundary and debauch the Indians of the south, in order to steal their furs. Bootlegging also became so widespread and so great a menace to peace that it was found necessary for the Government to take some

action. This resulted in the formation of the Royal North West Mounted Police. In 1874 this picked body of men made the long journey across the prairie to Fort MacLeod. Surgeon J. G. Kittson accompanied them from Dufferin and had as his assistant R. B. Nevitt, a medical student, who later became a qualified practitioner and remained in Ontario.

In 1878 Dr. George Allan Kennedy arrived at Fort MacLeod as Police Surgeon but later left the Force and engaged in general practice. A twelve-bed hospital was built for the use of the police at this place.

paper extolled the west as a country of brilliant and health-giving sunlight, a dryness excellently suited to lung affections, and an altitude which gave a zest to life that was absent in the east. It is a matter of record that the reader of the paper was regarded by the visiting members as an enthusiast who had lost his sense of judgment.

The officers of the new association were as follows: President, Dr. G. A. Kennedy; Vice-president, Dr. R. G. Brett; Secretary-treasurer, Dr. O. C. Edwards.

The second annual meeting was held in Medicine Hat.



The R.N.W.M.P. Hospital in Fort MacLeod. It is still standing.
Photograph by Dr. E. A. Braithwaite, Edmonton.

The coming of the Canadian Pacific Railway brought medical men to look after the workers on construction. In August, 1883, the railway entered Calgary and in the first passenger coach to cross the Bow River into the town was Dr. R. G. Brett, one of the founders of the Manitoba Medical College. Dr. A. N. Lindsay was with him; Doctors Olver, Henderson and J. D. Lafferty followed soon after.

In this same year Dr. Brett opened a small hospital in Banff. In 1886 the Galt Hospital was built by the Galt Mining Company in Lethbridge. It was attended by the surgeons of the R.N.W.M.P. Dr. F. H. Mewburn, who had been superintendent of the Winnipeg General Hospital for three years, was appointed surgeon to the company. Medicine Hat built a brick hospital in 1889. Calgary built in 1899 and the Grey Nuns opened the Edmonton General Hospital in 1895.

In 1885 the population of the territory now included, in the province was, exclusive of Indians, 5,000. These were mostly half-breeds. The chief centres of population were in the north, but with the coming of the railway there was an influx of settlers and the southern part of the province started to develop.

On August 13, and 14, 1889, the twentieth annual meeting of the Canadian Medical Association was held in Banff. This meeting was of very special interest since it was the first held within the boundaries of what was to be the Province of Alberta. It saw the birth of the North West Territories Medical Association. To it was contributed a paper by Dr. G. A. Kennedy, of Fort MacLeod, on "The Climate of Alberta." This

These early meetings were concerned mostly with discussions as to charges for life insurance and benefit society examinations and papers on the nature and treatment of a widespread fever then common on the prairies. It is now known to have been typhoid fever, but in the eighties it went by such local names as Red River, Saskatchewan, Nor'-West and Mountain Fever. Typhomalaria was also a name sometimes given to it. A tariff of fees was adopted. It differed very little from the present one. There was one item of interest, however. A special stethoscopic examination of the chest called for a fee of \$5.00 to \$10.00.

In 1905 the Province of Alberta was formed.

On March 7, 1905, a meeting was called in Calgary by the Council of the College of Physicians and Surgeons of the North West Territories. This was thought to be an opportune occasion to form a medical association in the new province. Thirty-one medical men were present. Banff was chosen for the first meeting and the following officers were elected: President, Dr. R. G. Brett, Banff; First vice-president, Dr. E. A. Braithwaite, Edmonton; Second vice-president, Dr. J. D. Lafferty, Calgary; Third vice-president, Dr. F. H. Mewburn, Lethbridge; Secretary-Treasurer, Dr. Gordon Cumming, Calgary.

At the first annual meeting of the new association a resolution was passed asking the Provincial Government to establish a bacteriological laboratory for the medical profession in Calgary. The code of ethics of the Ontario Medical Association in its entirety was adopted by the Association. In Banff, at the third annual meeting in 1908, Dr. R. G. Brett gave a report on

inter-provincial registration and said that Manitoba and Saskatchewan were anxious to join Alberta but that British Columbia was unwilling. Alberta favoured a board by which a man passing an examination could practice in all four western provinces. British Columbia men were opposed as they considered that "it was a case of giving more than they would be likely to receive."

At the fourth annual meeting held in Calgary in 1909, Dr. J. G. Adami, of McGill, and Dr. J. T. Fotheringham of the University of Toronto, were present and made Honorary Members on motion of Doctors W. A. Lincoln and Wm. Egbert. Dr. Fotheringham represented the Canadian Medical Association and urged the affiliation of the local association with that of the Dominion. Dr. Adami gave a paper on "Arteriosclerosis."

On January 15, 1902, a meeting of the practitioners of Edmonton and the surrounding towns was held in the office of Dr. H. L. McInnis and the North Alberta Medical Association was formed with Dr. W. M. Mackay as the first president. One of the members of the committee was Dr. Philippe Roy who became a senator in 1906, a commissioner to France in 1911, and has recently become Canadian Ambassador to that country. In 1905 this society was re-organized as the Northern Alberta Medical Association. Dr. W. D. Ferris was elected president and Dr. T. H. Whitelaw, secretary-treasurer. Professor A. Primrose of Toronto was present at the first regular meeting on March the 3rd and was made an Honorary Member.

The University of Alberta was founded in 1908 and in 1913 there was added a medical faculty. Dr. D. G. Revell, who was director of the Provincial Laboratory, was the first member of that staff to be appointed and he became the first Professor of Anatomy. Dr. H. H. Moshier, of Calgary, was then made Professor of Physiology. Only the primary subjects were taught for some years, the students completing their work at Toronto or McGill. The medical building was completed in 1922 and in that year the Strathcona Hospital became the property of the University and its name was changed. A Class "A" standing was given the medical faculty and a grant was obtained from the Rockefeller Foundation. A full course is now given and the University graduates its students with an M.D., C.M. degree.

In 1912, for the second time in its history, the Canadian Medical Association held its annual meeting in Alberta, at Edmonton, with Dr. H. G. Mackid of Calgary, as president.

In 1914, at the outbreak of the Great War many medical men volunteered their services to the government. Some went overseas and joined the Imperial Forces. A Field Ambulance was formed and saw service.

Dr. R. G. Brett became the second Lieutenant-Governor of the Province in 1915. He served a second term and was succeeded in 1925 by Dr. William Egbert of Calgary.

The medical progress of any country is perhaps best reflected in the legislation which is passed in

the interests of the people. A perusal of the various measures assented to by the Lieutenant-Governor-in-Council in this province since its formation shows clearly that whatever party was in power an effort has been made to safeguard the health of the people.

A Venereal Disease Act, modelled on that of Ontario, was the first to be put into force in the Dominion. This went into effect in 1918. A course for Public Nurses was organized in 1918 and four nurses attended. District nurses were appointed by the Government to outlying parts of the country where it was impossible for a medical man to make a living. A Municipal Hospitals Act was passed in 1919. This permitted several municipal districts to combine for the purpose of building a hospital. A Workmen's Compensation Act was passed in 1908 and revised in 1918.

There are a few men in active work today who have played a large part in the progress that has been made and have done the pioneering for us, the last that will be necessary in this country. They have witnessed the coming of the railway, the first automobile; they have seen the ox-cart that slowly creaked across the prairie with their medical supplies and mail become a curiosity, and the aeroplane become commonplace; they have seen the small rude hospitals of the frontier become a memory and have watched the growth of the many up-to-date institutions now caring for the sick of the Province—79 of them approved, with a bed accommodation of 2,800. The problem of handling the insane no longer vexes, for at Ponoka, where in 1911 the Mental Hospital was opened with 200 beds, it has recently had its capacity increased to 1,000. Oliver with its 250 beds takes care of any surplus. At Red Deer the Provincial Training School for mental defectives looks after 150 children. The treatment of the tuberculous presents few difficulties now, for the Central Alberta Sanatorium which was opened in 1920, houses 180 patients. A special institution for poliomyelitis victims is in operation at Edmonton. It has 60 beds. Besides these public institutions there are 70 private hospitals with more than 300 beds. Six hundred and seventeen thousand people have their medical needs supplied by 550 medical men.

The ashes of many a campfire around which Dr. Mackay sat with his Indian and Halfbreed companions half a century ago have long since been scattered by the winds of the north, but the visions he saw in the blue smoke of the dying embers are fast becoming a reality. He opened a chapter of medical history, the first in Alberta. It seems fitting to end that chapter now. What the next chapter will contain not even the most far-seeing of us dare predict.

To several of the practitioners of the early days the writer is indebted for much of the information regarding the history of the past. Dr. R. G. Brett, who came with the C.P.R. in 1883; Dr. E. A. Braithwaite, who joined the Mounted Police in 1884; Dr. F. H. Mewburn, who arrived in 1885; and Dr. J. D. Harrison, one of the first practitioners of Edmonton, have each contributed much.

AN ANATOMICAL RETROSPECT

By W. H. HATTIE, M.D.

Halifax

The twenty-eighth of January marks the centenary of an event in medical history which is unlikely to be celebrated. On the morning of that day, one hundred years ago, a huge crowd of Edinburgh's citizens gathered joyously to witness a hanging. A few weeks before, on Christmas day, the trial of William Burke had ended, much to the satisfaction of Auld Reekie's people, in the imposition of a sentence which, in those good old days, involved the services successively of hangman and anatomist. Burke had been found guilty of murder, and the court had pronounced that he should be returned to, and detained in, the Tolbooth, to be fed on bread and water only until the twenty-eighth of January "next to come," when he was to be taken to the common place of execution in the Lawnmarket, and there "hanged by the neck, by the hands of the common executioner, until he be dead, and his body thereafter to be delivered to Dr. Alexander Monro, Professor of Anatomy in the University of Edinburgh, to be by him publicly dissected and anatomized." Thus the common hangman and Alexander Monro *tertius* became associated, according to a legal requirement of the time, in the gruesome rites which were necessary to satisfy justice.

The verdict of the court would have assured the good burghers an unusually happy Christmas had William Hare and the two female accomplices of Burke received similar sentences. But Hare, upon promise of immunity, had turned King's evidence, and the Lord Advocate found himself "prisoner of his word," while the jury had found the guilt of one of the women "not proven" and the other had not been brought to trial. Thus, there were flies in the ointment, and the Christmas was less joyous than it might have been.

While the execution was set for January twenty-eighth, the populace proved thrifty enough to make a four-day event of it. Work on the erection of the gallows began on the twenty-seventh, and the masses fared forth in large numbers to witness progress and gloat over the prospect of a pleasing spectacle on the morrow. All through a drech, stormy night the work went on in the weird light of torches, and fascinated crowds stood watching, despite wind and rain and cold. Then came the great event. When Burke stepped on the platform, loud derisive cheers arose from thousands of throats, and joy was unconfined. After he had been hanged sufficiently to satisfy the onlookers, the body was removed to the laboratory of Monro *tertius*, where, in the early morning of the twenty-ninth, it was solemnly deliberated over by a small and very select company—which included Robert Liston—while, in the afternoon, Monro proceeded with the public dissection.

This proved to be another very popular event, to which all sorts and conditions of men and women demanded admission so emphatically that Monro gave up the attempt at lecturing and opened the doors to the mob. In the endeavour to preserve order, police were summoned, but proved powerless, and a riot ensued. At length an arrangement was effected by which parties of about fifty were admitted in as rapid succession as possible and allowed to view the corpse. This continued as long as daylight lasted. And on the following day, it is stated, fully twenty thousand persons passed through to be gratified by a last, though unloving, look at the remains of the unlamented.

For years the stupid stubbornness of legislators had penalized lack of anatomical knowledge in medical practitioners, and yet refused to grant a legal means for the acquisition of such knowledge. In consequence, the gentle art of grave-robbing came into being. For a time teachers and students of anatomy thieved for themselves, but as attendance at medical schools increased, and as the importance of personal experience in dissection became emphasized, the demand for anatomical *matériel* increased, and certain astute men discovered that body-snatching might be developed into a very profitable business. Of course it was illegal, and therefore the recipient of "subjects" would ask no questions. Moreover, there were great possibilities in the way of black-mail, should a disposition be shown to haggle over prices. At an enquiry conducted by a select committee of the House of Commons, in 1828, a trafficker in corpses testified that one gang of body-snatchers had collected and disposed of three hundred and twelve bodies during the winter session, at an average price of about four guineas. It is not surprising, therefore, that the operations of these gentry—very euphemistically termed "resurrectionists"—should have come to cause much concern, nor is it strange that the operations failed to receive the approval of thoughtful and considerate people. No one could be sure of a permanent burial. The epitaph on Shakespeare's grave stone is expressive of an uneasiness which was general:

Good frend for Jesvs sake forbear,
To digg the dvst enclosed heare:
Blest be ye man yt spares these stones
And cvrst be he yt moves my bones.

Naturally the resurrectionist was the object of greatest abhorrence, but the anatomist by no means escaped more or less opprobrium.

Sensitized by the stories of the misdeeds of resurrectionists, when the people of Edinburgh learned that Burke and Hare had murdered a poor but well known woman, named Docherty, in order that they might sell her body to an anatomist, the reaction was intense. And when it developed during the trial that the unfortunate woman was the sixteenth victim of the delectable pair, no ordinary expression of horror and repugnance would suffice; outraged sentiment could be

mollified only by the most rigorous application of the facilities for legal revenge. Hence, the unusual enthusiasm for a hanging to which reference has been made.

Popular displeasure included the anatomists, and existence was made miserable for perhaps the most brilliant teacher of anatomy of the period, Dr. Robert Knox, in whose laboratory the body of the Docherty woman was found, although it was proved that he was in no way associated with the murder, and his previous reputation had been excellent. On the other hand, the handicap imposed upon anatomical teaching by the lack of satisfactory laws was brought forcibly to public attention, and it was made manifest that this lack was an important factor in favouring the activities of the resurrectionists and in encouraging the even more despicable methods of Burke and Hare. Endeavours to secure suitable enactments were, however, thwarted, either because of legislative hostility or legislative inertia, until London was aroused by a small-scale repetition of Edinburgh's experience. This led to action, and with the passage of the Anatomy Act, in 1832, the incentive to either "burking" or grave-robbing was removed.

It seems odd that Britain should have been so slow in adopting an Anatomy Act. In this particular, other European countries were years in advance of her. It is, of course, well known that human dissection was in practically complete, if not complete, abeyance for many centuries after the fall of Alexandria. Just when the practice was resumed is not easy of determination, but there is a record as early as 1319 of procedure against four students who ventured to indulge in the engaging diversion of body-snatching. In 1240 a decree of Emperor Frederick II provided that a dissection was to be made every five years, presumably at Salerno, and it is to be assumed that the body of an executed criminal would be the subject. Later, other sovereigns made provision for an occasional public dissection, specifying that the bodies of criminals were to be used. England had to await the thirty-second year of that robust and marriageable sovereign Henry the eighth, (*i.e.*, 1540) before such a concession was granted. Then the United Company of Barbers and Surgeons was given permission to take the "bodies of ffoure condemned persons yerely for anatomies." Such meagre provision was manifestly insufficient. It is related that Rondelet, described as one of the gentlest and most pious of men, found himself without a subject when he was to inaugurate his anatomical theatre at Montpellier and in his extremity dissected the body of one of his own children. When so melancholy an incident could be attributed to lack of statutory provision, it is not strange that enthusiastic teachers and students resorted to questionable means of acquiring *matériel* for dissection.

There has been a disposition to lay the blame

for this condition of affairs upon the ecclesiastical authorities. While it could scarcely be expected of Church dignitaries to enthuse over dissection, there is good reason to believe that they did not take a stand against it. A bull of Pope Boniface VIII, dated 1300, is supposed by many to have been aimed at dissection. Recent researchers, however, tell us that it was not intended to apply to anatomical studies but rather to a curious practice which had grown up amongst Crusaders. The bodies of some deceased Crusaders were dismembered by comrades and boiled in order that the bones might be returned to the homeland. This idea took such strong hold of the imagination of succeeding Crusaders that many of them included in their impedimenta huge cauldrons, in the pleasant anticipation of being boiled therein in event of death. In time the practice reached such proportions as to attract ecclesiastical attention. Whether because it appeared to invite too early an exposure to fervent heat or to suggest an attempt at interference with the judicial prerogative of St. Peter, or whatever the reason, a papal bull forbade the practice. And this, it seems, was rather generally, although wrongly, interpreted to forbid dissection also, and in consequence the civil authorities feared to enact laws legalizing and favouring dissection.

Whatever the facts may have been, grave-robbing for "anatomies" became so common that church authorities were scandalized and joined the anatomists and others in the demand for suitable legislation. It came slowly everywhere, but more slowly in Britain than elsewhere in Europe. For this reason other countries, notably France and Holland, made greater advances and provided better opportunities for study in anatomy. But it must not be forgotten that it was in the strenuous days—or nights—when graves were rifled for *matériel* that reform in anatomical teaching and advance in anatomical knowledge began. While not condoning their violation of law, we must admire the enthusiasm and devotion of the pioneers and acknowledge our debt to them. We can rejoice, too, that out of their necessities there gradually developed a sentiment which led to the fairly satisfactory laws that apply to anatomical studies today.

A NOTE ON THE FOUNDING OF DALHOUSIE UNIVERSITY

BY W. H. HATTIE, M.D.

Halifax, N.S.

The death, late in December, of George Maule Ramsay, the fourteenth Earl of Dalhousie, is of interest to many medical men throughout Canada whose Alma Mater was founded by and named after one of his ancestors. After a distinguished military career—he was one of Wellington's generals—George Ramsay, ninth Earl of Dalhousie, was appointed Lieutenant-Governor of

Nova Scotia in 1816. One of the problems he had to solve was the disposition of a sum of money which had been collected in Customs taxes at the port of Castine, Maine, while that port was occupied by British forces and administered by the then Lieutenant-Governor of Nova Scotia, in the course of the war of 1812. He decided to recommend to the Home Government that the major portion of the fund, or approximately £10,000, should be devoted to the "founding of a College or Academy on the same plan and principle as that in Edinburgh. . . . open to all occupations and sects of religion. . . . and having the power to expand with the growth and improvement of our society." The necessary approval having been secured, Dalhousie College was founded in 1818, and construction work was commenced soon thereafter. At the laying of the corner stone, Lord Dalhousie delivered a singularly appropriate address, from which the following is excerpted:

"It is under His Majesty's most gracious approbation of this institution that I meet you here today; and, as his humble representative, I lay this corner stone of the building. I here perform an act which appears to me to promise incalculable advantages to this country; and if my name, as Governor of the Province, can be associated with your future well-being, it is upon the foundation of this College that I could desire to rest it. From this College every blessing may flow over your country; in a few months hence it may dispense blessings to those whom I now address; may it continue to dispense them to the latest ages! Let no jealousy disturb its peace, let no lukewarm indifference check its growth. Protect it in its first years and it will abundantly repay your care."

After completing his term as Lieutenant-Governor of Nova Scotia, the Earl of Dalhousie was appointed Governor-General of Canada, and later was made Commander-in-Chief of the British forces in India. In each capacity he served with great distinction, but undoubtedly the greatest monument to his memory is the University which proudly bears his name, which for more than a century has dispensed

blessings and incalculable advantages to this country, and amply fulfilled the prophetic hope expressed by its founder in his dedicatory address.

A LETTER FROM THE PAST*

TO THE EDITOR OF THE MEDICAL GAZETTE.

Sir:

Many instruments have been projected to obviate the inconvenience and danger arising from hernia. I have found none so applicable to double inguinal hernia as an improvement I made upon Law and Oddy's patent double inguinal truss.

I discovered, upon examination, that Law and Oddy's truss produced its pressure above the site of the point of protrusion; therefore I removed the two interior pads, and in their stead constructed two iron extremities, the shape and size of the common truss, which were firmly rivetted to the anterior extremities of the patent truss, and padded as usual. A soft silk handkerchief being placed between the truss and the integuments will materially diminish the friction. I feel assured that this improved truss will answer a better purpose than any I have seen; which induces me to request the insertion of this notice in your Gazette.

I am, sir,
Your obedient servant,
Joseph Chipman.

Pictou, Nova Scotia, America,
August 15, 1833.

This communication is from one of your admiring subscribers, and will be conveyed by the Royal William; which will be the first steam-vessel that ever will have crossed the Atlantic.

London Medical Gazette,
Saturday, September 21, 1833.

*[We have much pleasure in publishing this old letter, and will be glad if any of our readers can give us any information regarding this Dr. Joseph Chipman, of Pictou, who appears to have had a useful mechanical turn of mind.—Editor].

BLOOD CHOLESTEROL STUDIES IN CANCER.—Blood cholesterol values and ratios of the relation of plasma and whole blood cholesterol are reported by Walter L. Mattick and Kenneth Buchwald, in twenty healthy, 101 cancerous, and seventy-five noncancerous patients ill with various diseases. A plasma whole blood cholesterol ratio of greater than one was found in 86 per cent of the cancer cases. This disturbed ratio is probably a fairly constant finding in cancer. A plasma whole blood cholesterol ratio of less than one was the usual finding in 80 per

cent or more of the healthy. In noncancerous diseases this ratio seemed to be in accordance with that in health in 67 per cent, whereas in 33 per cent it was reversed, as in cancer, which is possibly explained on the basis of a temporary derangement of this ratio in some noncancerous diseases. Such observations might justify a more critical investigation of the theories of defective lipolysis as the basis of cancer pathogenesis.—*J. Am. M. Ass.* 91: 1087, Oct. 13, 1928.

Special Correspondence

The London Letter*(From our own correspondent)*

The mixing up of politics and medicine occurs from time to time, and however much the idea of "state interference" may be disliked it cannot be denied that the profession is very much dependent upon a certain amount of control by Parliament. This is shown in the new "Derating Bill," as the measure introduced by the Minister of Health is called, for alongside the general controversy over the very complicated plans for reorganizing the whole of local government there is considerable discussion as to the effects on the medical world. Opponents of the Bill say that one effect of its becoming law will be to reduce considerably the Child Welfare and Maternity work, which has been such a feature of "preventive medicine" during this century, because of altered financial provisions. All medical assistance under the "Poor Law" will disappear as such, for the "Guardians of the Poor" are to be abolished and their functions transferred to the county councils and borough councils. This means that all the Poor Law infirmaries will become municipal hospitals. During the past few years the latter name has already been adopted and the effect of the change of governorship ought to be the removal for ever of the stigma of pauperism from those patients who obtain treatment at such institutions. It should also render many more beds available in London for the real hospital class of case and relieve pressure on the voluntary hospitals. Indirectly, the future of these last institutions may be affected considerably, so that all hospital and infirmary doctors, all child-welfare medical officers, and most of the public health officials expect to see changes in their positions under the new bill when it is passed.

The freedom of the general practitioner does not appear to be threatened directly by the new proposals, but for some time past it has been felt that the activities of local authorities in public health matters were encroaching to a certain extent on the sphere of private practice. At the annual meeting of the British Medical Association in 1927 the Council was urged to investigate the problem. A "private practice committee" was set up and has recently issued a report. The medical secretary of the Association investigated many centres of public medical work, numbering 53 in all, and he records certain strong impressions with which he has been left. Firstly, that the work done is such that every doctor must agree ought to be done by somebody, and, secondly, that it was not being done,

or only to a miserably small extent, before the public authorities undertook it. The value of work done at maternity and child-welfare centres is incalculable, and the poor patients who attend would never go to their own doctors in similar circumstances. Thus, so long as some check is kept upon the wage-earnings of the patients receiving medical aid from public authorities, it would seem that the private practitioner has little of which to complain. Certain recent developments, however, are viewed with more suspicion. Women of the middle and even of the upper classes are beginning to realize that their poorer sisters get a great deal more attention before and after baby is born than they do, and in a certain part of London an attempt has been made to found a welfare centre for women and babies above the "hospital class." This last development has already been mentioned in these notes, as it was considerably discussed at the Cardiff Meeting in 1928. The fact is that in the evolution of the modern system of public health the private practitioner has been only partially fitted into the scheme of things under the National Health Insurance system. Instead of the family doctor resisting all encroachment upon his private practice he must seek to find his place in the inevitable (and the word is used deliberately) development of a state medical service of sorts.

While the future of the medical treatment of the human beings in this country is a matter of controversy the health of our dogs is promised considerable improvement with the prospect of stamping out distemper. Those who oppose vivisection are in a dilemma, for the work of the past five years, inaugurated by the Medical Research Council and the "Distemper Fund" raised by *The Field*, has of necessity been carried out on dogs by vivisectionists. It has been decided that it is quite immoral to experiment on animals for the sake of human beings, but the ethics whereof the benefit of other animals is concerned have not been fully worked out. This is by the way. The remarks are suggested by a report recently issued, which shows that even if all is not yet known about distemper (and the work is not completed) much can be done to prevent it by means of a vaccine. The virus has yet to be cultivated successfully apart from the living animal, the present method of vaccination must be perfected, and the protective serum has to be further investigated, but despite all this great advances have been made.

ALAN MONCRIEFF

London, January 1929.

The Edinburgh Letter

(From our own correspondent)

At the half yearly meeting of the General Council of Edinburgh University, Principal Sir Alfred Ewing referred to the increase in the number of students which has taken place. There are at present at British Universities 3,978 students from outside the British Isles. Of these 574 study at Edinburgh. Cambridge comes second with 546; Oxford third with 507; then University College, London, fourth with 312; and Glasgow fifth, with 190. In Scotland the large proportion of students in the four universities live either at home or in lodgings, only six per cent residing in halls or hostels. Among the 4,349 undergraduates at Edinburgh University are found students from all the British Dominions and from many foreign countries. Canada sends 34, Australasia 33, India 162, Africa including Egypt 170, West Indies 34, United States 102, and about 50 other countries 56 more. A great number of applications have come from American students of medicine, for admission to the University after completing the first year of medical study at home. Fully 600 inquiries of this nature have been received since last January. It has not been possible to accept all the applicants but room has been found for a number, and at present there are about 75 American undergraduates engaged in the study of medicine. The cost of running the University increases from year to year. Last year the general expenditure, exclusive of the cost of fresh buildings or new properties, was £278,000. This is £30,000 more than it was three years ago. This expenditure is equivalent to a regular payment of £706 a day over the whole year including Sundays.

The revised scheme for the curriculum of the Diploma in Tropical Medicine and Hygiene has been approved by the University Court. Edinburgh University has been recognized by the Colonial Office as an institution where the study of tropical medicine may be pursued. The revised course of study has been devised to meet the requirement of Officers of the Colonial Medical Services.

Mr. G. K. Chesterton, LL.D.(Edin.) has consented to stand as Liberal candidate in the University Rectorial Election which will be held in October 1929.

Intimation of gifts amounting to £15,000, for the endowment of the Department of Surgery under Professor D. P. D. Wilkie, has been received by the University Court. Of this sum £10,000 have been given by the Rockefeller Foundation. The other £5,000 have been gifted by Mr. Thomas Cowan, LL.D. This is not Mr. Cowan's first generous donation to the University. Mr. Cowan's gift is specially intended for research in surgery and is to be known as "The Cowan Research Fund." In addition a gift of £5,000 from Sir Leybourne Davidson, of Huntly Lodge, has been intimated. This sum

of money is for the endowment of a fellowship for the encouragement and promotion of research in bacteriology and immunology.

A dinner was held recently in the Royal College of Surgeons, to entertain Dr. Thomas William Drinkwater, in honour of his completing fifty years as a lecturer in the School of Medicine of the Royal Colleges of Physicians and Surgeons of Edinburgh. Sir David Wallace, K.B.E., presided at the dinner, which included some forty of Dr. Drinkwater's fellow lecturers and colleagues in the School of Medicine. Dr. Drinkwater was appointed Lecturer in Chemistry in 1878, and since then has continued to hold large classes. He was one of the earliest chemists to commence analytic work in connection with the public health movement of last century. In addition to being a highly successful teacher Dr. Drinkwater will also be remembered with gratitude by an older generation of students for his great abilities as a pianist. In former days no student entertainment was complete without his contribution in song and story. Despite his long tenure of office, Dr. Drinkwater is still actively engaged in teaching and in medico-legal work.

In his annual report of the Royal Edinburgh Hospital for Mental and Nervous Diseases, Dr. George M. Robertson points out that 62 per cent of the admissions entered the hospital as voluntary patients. It is obvious that with such a large number of patients entering of their own free wills, an asylum is becoming less a place of detention and more a centre for treatment. Advice is now being sought at a much earlier stage than formerly. Four out of every five patients who enter voluntarily now leave within the year. This active movement of the population of a mental hospital acts beneficially all round and a hopeful and cheerful atmosphere is created in the institution. It is found that voluntary patients are admitted for treatment much sooner than certified patients. They come when their malady is more recent and less serious; they are more contented to be treated, their residence in the hospital is shorter; and a larger proportion of them recover, though many of them leave before they are quite well. This is particularly the case in regard to melancholia. In these cases voluntary treatment leads to earlier recovery and is responsible for the prevention of many suicides. The admission of voluntary patients is not confined to institutions admitting private paying patients, such as the Royal Edinburgh Hospital. In the Edinburgh District Asylum the number of voluntary patients is increasing. These patients are paid for by the rates. The parish authorities recognize that because these patients are not certified the Government Grant, which is obtainable in the case of certified patients, is lost. They are however fully aware that this is more than compensated for by the fact that the patients entered at an earlier stage in their mental disorder, and there is therefore a greater prospect

of them returning to their homes completely cured.

Another link with Lord Lister has been severed by the death of Sir Hector Clare Cameron, LL.D. In 1868 he became assistant to Lister in the Glasgow Royal Infirmary, and commenced a friendship which lasted through life. When Lister removed to Edinburgh, Sir Hector remained in Glasgow, spreading the doctrines of the antiseptic school. In 1900, when Dr. George Buchanan retired, Sir Hector was elected to the Chair of Clinical Surgery, which he occupied till 1910. During the War, though already past the allotted span of three score and ten years, he became Red Cross Commissioner for the Western District of Scotland. It will be remembered that at the meeting of the British Medical Association in Toronto in 1906 he was president of the Surgical Section. For a number of years Sir Hector Cameron has held a unique position in the hearts of medical men north of the Tweed, and east and west have united in honouring him as the "Grand Old Man of Scottish Medicine," while he has been fittingly described as Lister's "beloved disciple." Most appropriately, in view of his close association with the great surgeon, Sir Hector was invited in 1924 to unveil the memorial to Lord Lister in Kelvingrove Park, Glasgow.

The managers of the Edinburgh Royal Infirmary have approved a scheme for the establishment of a Radium Institute. This will be the first of its kind in Scotland. Forty thousand pounds is to be contributed from the Infirmary finances for the purpose of re-constructing a property at Murrayfield, one of the most desirable parts of the city. It is intended that this Radium Institute should be capable of accommodating 30 in-patients. It will serve the needs especially of Edinburgh and the south-east of Scotland. Those best qualified to speak on the subject have strongly urged the need of centralizing radium work in Scotland. The fact that radium is scarce and costly is only one of these reasons. Good results from treatment can only be obtained by knowledge, and the constant practice that may be gained in centres such as Edinburgh. A Radium Institute has been established already in London and in one or two centres in England. At the same time a gift of £10,000 has been made for the purchase of radium for one of the Glasgow hospitals.

The Medical Officer of Health, Dr. Robertson, estimates that another fifteen or twenty years must elapse before the slums become rare sights

in Edinburgh. At present there are in the city 5,035 houses which have been condemned as being unfit for human habitation. Many of these will be included in slum clearance schemes, and so will gradually be demolished. Since the War several different housing schemes have been successfully launched by the Corporation, and numerous new houses have been constructed and are now inhabited, but an annual contribution of 500 new houses will be necessary, to break the back of the housing needs of the necessitous before slums will be unknown in the city.

A scheme for the re-construction of a portion of Glasgow Royal Infirmary has now been completed at a cost of £70,000. This was the project which included the demolition of the famous Lister Ward and in consequence came in for considerable criticism. Two new casualty wards, a reception hall, and the Lister Lecture Theatre form the main part of the plan. A panel has been inserted in the outside wall of the theatre bearing the following inscription: "On this site stood the surgical ward in which, from 1861 to 1869, Joseph Lister, Regius Professor of Surgery in the University of Glasgow, initiated the method of antiseptic treatment."

While the voluntary hospitals of Scotland have been sedulously keeping themselves abreast of the most recent developments in medicine and surgery, those institutions administered by local authorities have not been behindhand. The electro-medical department of Stobhill Hospital was recently equipped at a cost of £40,000. Stobhill Hospital is controlled by the Glasgow Parish Council, and is under the supervision of the Health Board of Scotland. This hospital is the largest in Great Britain, having accommodation for 1,900 beds, 600 of which are allotted for children, and a staff of over 500. Treatment in this institution is not entirely confined to Poor Law patients, and sick persons are brought to this hospital from all parts of Scotland. From 1914 to 1920 the hospital was in the hands of the military authorities, and at one time over 3,000 military patients were under treatment in the hospital or in temporary erections in the grounds. The new electric department provides facilities for x-ray and sunlight treatment, massage rooms, operating theatres, and eye, ear and dental departments. In addition, there has been re-constructed a new pathological department.

GEORGE GIBSON

23 Cluny Terrace, Edinburgh.

ARACHNODACTYL.—At a meeting of the Pædiatric Society in Paris, lately, Schreiber, Duhem, and Jubert showed a female infant, aged five months, affected by the congenital malformation described by Marfan in 1896 under the name "dolichostenomelia," and in 1902 by Achard under that of "arachnodaelyly." In the

case described, to the elongation of the long bones of the limbs, predominating at the tips of the extremities, and characteristic of the affection, was added an enlargement of the sella turcica, an extreme laxity of all the joints and a generalized muscular hypertonía.

Association Notes

The Annual Meeting, Montreal

June, 17, 18, 19, 20 and 21.

Announcement No. 1 appeared on page 70 *et seq.* in the January issue and dealt with the general plan of the meeting, giving a list with addresses of local Chairmen and Secretaries in charge of the General and Sectional Programs, and hotel accommodation with rates.

TRANSPORTATION ARRANGEMENTS

On the occasion of former meetings the Convention Certificate plan, although offering return transportation for fare and one half, was found unsatisfactory because of the detail and trouble, *viz.*, the obtaining and signing of certificates at time of purchase of the ticket, the turning in of certificates for *visé* at time of registration, the reclaiming of certificates after *visé*, and again visiting ticket agent for purchase of return ticket.

For the Montreal meeting all of these troublesome details have been overcome by adopting the IDENTIFICATION CERTIFICATE PLAN.

1. Under this plan *round trip tickets* will be sold to Montreal, upon presentation of "Identification certificate," for one way adult fare and one half (plus 25 cents); sufficient will be added to make the fare end in 0 or 5. The minimum round-trip fare will be \$1.25.

2. Tickets for *members of the family* may be purchased at the same time, with the same certificate and on the same terms.

3. *Children*.—Children under five years of age and accompanied by parent or guardian, free; five years of age and under twelve, one half the regular adult fare named in para. 1, plus 25 cents; sufficient will be added to make the fare

end in 0 or 5. The minimum round-trip fare will be 75 cents.

4. *Routes*.—Tickets may be used only via the same route in both directions, over lines shown in current tariffs.

5. *Dates of Sale*.—Three days (not counting Sunday) before the opening date of meeting, or during the first three days of meeting, *i. e.*, date of purchase and departure from home, June 13 to 19 inclusive.

6. *Return Limit*.—To reach original starting point not later than midnight of fifth day (not counting Sunday) after last day of Convention, *i. e.*, not later than midnight of June 27.

7. *Territory*.—From Newfoundland, the Maritime Provinces, from Quebec, and from Ontario east of and including Armstrong, Port Arthur and Fort William. Application has been made for a plan to cover the western territory to the Pacific Coast.

8. *Special Concession*.—For one and three-fifths of the regular one-way fare (plus 25 cents etc.) the return limit is extended to thirty days in addition to date of sale.

9. *Comparison*.—For the information of members a table is subjoined showing comparative rates and limit privileges from points further west than Fort William (1928 table; Government Tax included).

TO MONTREAL FROM	ONE-WAY	REGULAR ROUND TRIP	SUMMER TOURIST ROUND TRIP	IDENTIFICATION CERTIFICATE PLAN
Victoria, Vancouver and Prince Rupert.....	\$101.99	(A) \$183.55	(D) \$138.45	(E) \$152.96
Nelson, B.C.....	88.80	(A) 160.00	138.45	133.20
Lethbridge, Alta.....	75.95	(A) 135.10	131.85	112.60
Calgary and Edmonton....	76.30	(B) 137.30	133.15	114.40
Saskatoon.....	64.90	(B) 116.80	113.20	97.55
Moose Jaw.....	62.40	(B) 112.30	108.65	93.60
Regina.....	60.95	(B) 109.65	106.00	91.40
Brandon.....	53.15	(B) 95.65	91.95	79.70
Winnipeg.....	48.50	(B) 87.30	83.65	72.75
Fort William.....	34.60	(C) 62.30	62.30	51.95

(A) "All Year Tourist" rate—limit of tickets, 9 months.

(B) "All Year Tourist" rate—limit of tickets, 60 days.

(C) Thirty-Day rate—limit of tickets, 30 days.

(D) "Summer Tourist" tickets on sale from May 15; limited to October 31.

(E) "Identification Certificate Plan"—basis, single fare and one-half for the round trip; limits, June 13 to 27.

10. The privileges of Identification Certificate Plan apply to transportation by water as well as by rail. Tickets are not transferable on pain of forfeiture.

11. *Questionnaire*.—In due time there will be sent you from the Canadian Medical Association office a questionnaire requiring your completion and stating whether you wish to travel to Montreal under the plan. If so, the Identification Certificate will be promptly mailed to you.

POST-CONVENTION TRIPS

There are so many delightful trips in the region about Montreal, by rail, by boat, by motor bus, that information will be forwarded you by the various transportation companies concerned.

Already there have been completed arrangements for a cruise to the Saguenay River on the Clarke S. S. Company's vessel "Northland." Descriptive literature will shortly reach you direct.

Because of the delightful experience of last summer when our members travelled by this ship to the meeting at Charlottetown the Executive of the Canadian Medical Association heartily endorses and recommends this five days' cruise.

AUTOMOBILE TRANSPORTATION

For those who plan to motor to Montreal there will be published in the March issue information regarding garage accommodation, and an offer of assistance regarding routes and road conditions from the Montreal Tourist and Convention Bureau.

THE "HOBBIES EXHIBIT"

The attention of our members is again directed to the "Hobbies Exhibit" which will be held in conjunction with the annual meeting in Montreal during the week of June the 17th. Judging by the number of enquiries that have been received, and the list of exhibitors who have promised contributions, this exposition of craftsmanship should prove most interesting. The small ex-

hibit of paintings at the Toronto meeting two years ago roused such approbation of the idea that the committee in charge has decided to enlarge the exhibit to include all of the creative hobbies and not limit the contributions to paintings alone.

It is a pleasure to note the number of our colleagues who have made intensive studies of subjects extending far beyond the range of their daily work. Horticulture, botany, history, philately, sculpture, wood carving and many other fascinating fields for diversion have claimed their interest. Several have crystallized their observations in published works which have received wide recognition.

The committee in charge is particularly anxious to hear from, or of, any doctors in Canada who might contribute to this exhibit. With becoming professional humility, many of those with the greatest talent hesitate to call attention to their own achievements and so many a work of beauty and interest

" . . . is born to blush unseen
And waste its sweetness on the desert air."

No one need hesitate to exhibit for fear of criticism; this exhibition will be essentially one for amateurs. In case some gifted but modest confrère in your district or of your acquaintance may hesitate to reply, we would appreciate a note from any reader giving us the name and address of such physician, thus enabling us to communicate with him or her directly. We are particularly desirous of securing exhibits of modelling, etchings, paintings, photography, wood carving, published essays or books, music, horticultural hybridizing, stamps, coins, or any other creative hobby. Naturally, the work must be that of the physician himself and not a collection of the work of others. Such exhibits will be carefully guarded and insured if necessary. Any information about your own, or your neighbour's hobbies will be gratefully received by Dr. G. E. Tremble, 1390 Sherbrooke Street, W., Montreal, who will be in charge of the exhibit, or by Dr. Harvey Agnew, Associate Secretary, 184 College Street, Toronto.

University Notes

Dalhousie University

Dr. Ernest W. H. Cruikshank, M.D. (Aber.), D.Sc. (Lond.), Ph.D. (Cantab.), M. R. C. S. (Lond.), F. R. S. (Edin.), arrived at Halifax, December 22nd. on the S.S. "Transylvania." Dr. Cruikshank comes to Dalhousie University as Director of the Department of Physiology. From 1920-1924 he held a similar post at the Pekin Union Medical College, Pekin, China. He was then granted a leave of absence and, after spending eighteen months at Cambridge

University, accepted an appointment as Director of the Department of Physiology and Biochemistry, Prince of Wales Medical College, Batna, India. Dr. Cruikshank sailed from India on Armistice Day, and except for a short visit with old friends at Aberdeen came direct to Halifax.

Dr. N.B. Dreyer, of the Department of Pharmacology, McGill University, who has been in charge of the Department of Physiology at Dalhousie University during the past few months,

has returned to Montreal. Dr. Dreyer was granted a special leave of absence from McGill early in October, in order to direct the Physiological Laboratories at Dalhousie until the arrival of the present Department Head, Dr. E. W. H. Cruikshank. Both the Faculty and the students at Dalhousie, where Dr. Dreyer held an appointment from 1924-27, unite in extending to him their sincere appreciation of his services.

The many friends of Dr. W. H. Hattie, Assistant Deap of the Medical School, Dalhousie University, will be pleased to learn that he is sufficiently recovered from his long illness to have visited his office occasionally, at the Dalhousie Health Centre. He has left to spend the remainder of the winter in the Southern States.

Two portraits were recently presented to the Medical School of Dalhousie University, and, by a strange coincidence, each portrait is the work of a son of the person portrayed. One is that of the late Dr. Alexander G. Hattie, a member of the original faculty sixty years ago and the first Lecturer in Obstetrics. After practising in Halifax for many years, on account of his health he went to the West Indies soon after the establishment of the medical school. There he resumed the proper family name, McHattie, and his portrait, a fine etching, bears the signature of T. McHattie, a son who practised medicine in London until a few years ago, and who has won a place of eminence among English artists.

The other portrait was of Dr. Archibald Lawson, who was appointed to the faculty in 1872 as Demonstrator of Anatomy, later Professor of Surgery and still later Professor of Medicine. He left Halifax in 1884, but returned about 1914, passing away a few years ago. His portrait, in oils, was painted several years ago by his son Ernest, who has gained considerable renown as an artist in the United States. The University has good reason to be proud of the collection of pictures of those associated with the early history of the medical school, a collection not excelled by many larger institutions.

Included in the "Extension Program" of Dalhousie University is a series of broadcast lectures to which Professors Bean, Gibbs, and Young, of the medical school, are contributing.

McGill University

Several gifts of large sums of money have been made to various departments at McGill University and were reported at the meeting of the Board of Governors; one of \$25,000 to the Department of Neurological Surgery in the Department of Medicine was donated jointly by Dr. and Mrs. L. L. Reford, Mr. and Mrs. A. A. Hodgson, and the late John M. McIntyre (during his lifetime).

The department of neurological surgery, faculty of medicine, under the direction of Dr. Wilder Penfield, has been made the recipient of this sum of money which has been donated for the purpose of developing the highest type of brain and nerve surgery and research. With this end in view and with the aid of this fund the university has already been able to provide a series of laboratories in the Royal Victoria Hospital and to appoint assistants and technicians to carry on the scientific part of the work.

Dr. Penfield has been engaged in gathering about him a group of workers in this field, and it is believed that in a very short period of time research in this department will make Montreal one of the most attractive centres for the study and treatment of diseases of the nervous system.

Three scholarships for students in the Faculty of Medicine, each valued at \$2,000.00 and payable in instalments of \$400.00 per annum for five years, were donated respectively by Mr. C. W. Lindsay, Mr. A. B. Purvis, and an anonymous giver.

Another scholarship, established under the will of a late graduate of the Faculty of Medicine, J. Francis Williams, and valued at \$500.00 per annum, was bequeathed in perpetuity. This scholarship is to be donated to the student in the final year who passes the best examination in the subject of Clinical Medicine and is to be used towards the furtherance of his academic career.

The Laboratory of Experimental Surgery which is adjacent to and connected with the Biological Building, contains operating rooms, storage rooms for a large number of animals, as well as provision for isolation and convalescence. The building is now complete, and will be in operation in the course of the next few weeks. It is the gift of Dr. C. F. and Mrs. Martin and Mr. P. P. Cowans.

Recent appointments are: Dr. D. Grant Campbell, Lecturer in Medicine; Dr. C. J. Tidmarsh, Assistant Demonstrator in Medicine.

Toronto University

Professor Andrew Hunter, M.A., B.Sc., Edin., M.B., Ch.B., Edin., Head of the Department of Biochemistry in the University of Toronto, expects to leave Toronto in April to take up his new duties at Glasgow University, where he will hold the Chair of Physiological Chemistry. Professor Hunter has been at the Toronto University for thirteen years. He held the Chair of Pathological Chemistry from 1915-30 and the Chair of Biochemistry from 1919 to the present time.

Dr. Oskar Klotz, Professor of Pathology and

Bacteriology at the University of Toronto, returned to Toronto from West Africa in the beginning of December.

He had left Toronto last April for a second visit to Lagos, West Africa, to continue investigations into the cause of yellow fever for the Rockefeller Foundation. After five months' work in Africa, he sailed on October 5th for England and New York. Shortly after leaving Southampton, he took ill with fever and malaise, which were thought to be due to sinus trouble. The symptoms persisted throughout the voyage, so that on his arrival in New York he was taken to the Hospital of the Rockefeller Institute, where the cause was discovered to be malaria and treatment instituted for this disease. The seriousness of his illness gradually became less alarming and after a month, he was well enough to return to his home in Toronto. Although he has not fully regained his former strength, he has sufficiently recovered to resume his duties at the University. Congratulations are extended to him on the successful fulfilment of a difficult and dangerous mission and the regaining of his health.

At the early age of twenty-nine, Charles Herbert Best, M.A., M.B., D.Sc., associate with Dr. Banting in the discovery of insulin, has been appointed professor of physiology at the University of Toronto. The announcement of the appointment was made on January 10th, following a meeting of the board of governors. Dr. Best will succeed Professor J. R. McLeod, who has left to accept a post at the University of Aberdeen, Scotland. Dr. Best took an important share in the discovery of insulin before he graduated in medicine.

Dr. William L. Holman has been appointed Professor of Bacteriology and Associate Director of Applied Bacteriology; Dr. William L. Robinson, Associate Professor and Associate Director of Applied Pathology; and Dr. Wallace A. Scott, Assistant Professor of Obstetrics and Gynaecology.

Three hundred and five graduates in Medicine in the University of Toronto have already made application for the M.D. degree, under the new ruling, which reads: "The Senate of the University of Toronto, on the recommendation of the Faculty of Medicine, determined to grant the M.D. to students on graduation instead of the M.B. It was further determined to bestow the doctor's degree in Medicine upon any graduate of this University who may apply for it."

Toronto is possibly the last University on the continent to adopt the practice of granting the M.D. to students on graduation.

University of Western Ontario

Professor F. R. Miller, of the Medical Faculty

of the University of Western Ontario, has been selected for membership on the Editorial Board of the *British Journal of Physiology*. Dr. Miller is well known in physiological circles for his researches in neurology, and is one of the two Canadians who are now members of the Editorial Board, the other being Professor J. B. Collip of McGill University.

Professor C. C. Macklin, of the Department of Anatomy of the University of Western Ontario, has recently been appointed Chairman of the Canadian Eugenics Committee of the American Eugenics Society. This Society, which is represented in most, if not all, of the leading universities of the United States, has as its President Dr. C. C. Little, President of the University of Michigan. On its Advisory Council are many of the leading scientists of this continent, including a number of Canadians.

University of Manitoba

At a recent meeting of the Winnipeg Junior Board of Trade the Chancellor of the University, Archbishop Mackay, intimated that an early solution of the vexed problem of site and new buildings might be expected. In point of student registration Manitoba University was the second in Canada, but this province did not give anything like the financial assistance to its university that was given by several other provinces.

Dr. C. R. Gilmour has been appointed Professor of Medicine, succeeding Dr. Chas. Hunter.

London University

In the new university quarter of London the scheme for a great school of preventive medicine, which is at once a school of the University and an imperial and international centre, is nearing completion. In the ranks of the research workers and post-graduate students who will attend this centre there will be found those destined to become the medical officers of health of the future, and to serve in this capacity in this country or overseas. The wonderful progress in public health in all directions during the last half-century, and the rapid growth of an enlightened public opinion which has made this progress possible, give every promise that the new school will succeed, and the measure of its success should be reflected in the vital statistics and the reports of medical officers in the future.

The London School of Hygiene and Tropical Medicine owes its inception to the recommendations of a committee presided over by the Earl of Athlone in 1921, and to the timely and large beneficence of the trustees of the Rockefeller

Foundation, who, recognizing the unique claim on London to be a world centre for the teaching of hygiene, offered the sum of nearly half a million sterling to provide a site, and to build and equip a school of hygiene if the British Government would undertake that it should be adequately maintained. The gift was accepted and the responsibility undertaken.

The new building is, so far as the main structure goes, approaching completion, but will not be ready for the formal opening until the summer of next year. It stands behind the British Museum, and is near the University College and immediately adjacent to the newly acquired site of the University of London.

The Rhodes Trustees have made a donation of £5,000 to the fund for a hall of residence "for oversea and British students at the University of London," and have set aside £5,000 towards the building of a Students' Union.

Cambridge University

Mr. John Humphrey Plummer, of Southport, who died last week at the age of seventy-eight years, has left estate valued at over £250,000, almost all of which has been bequeathed to Cambridge University in the form of a trust, to be known as the John Humphrey Plummer Foundation. The bequest to Cambridge is to go to the endowment of two chairs for the promotion of modern scientific research.

Edinburgh University

Intimation has been received by the Court of the University of Edinburgh of two substantial gifts for the endowment of a department of surgery. Of the total of £15,000, £10,000 has been given by the Rockefeller Foundation and £5,000 by Mr. Thomas Cowan of Leith.

Glasgow University

The Gardiner chair of physiological chemistry in the University of Glasgow has been filled by the appointment by the University Court of Professor Andrew Hunter of Toronto. The chair was recently rendered vacant by the promotion of Professor Cathcart to the Regius Chair of Physiology in succession to Professor D. Noël Paton. Professor Hunter graduated M.B., Ch.B. at Edinburgh University in 1901, and, after a period of post-graduate study at the Universities of Berlin and Heidelberg, was appointed Assistant Professor of Biological Chemistry at Cornell University, U.S.A., and later Professor of Biological Chemistry in the University of Toronto. The new professor is expected to take up his duties at Glasgow early in the year.

St. Andrew's University

Dr. John McGibbon, formerly of the University of Witwatersrand, Johannesburg, S.A., was installed as Professor of Midwifery and Gynaecology on Nov. 9th, 1928, succeeding Professor John A. C. Kynoch.

University of Aberdeen

At a meeting of the University Court of the University of Aberdeen on December 13th it was announced that Dr. Charles Reid, Lecturer in Experimental Physiology in the University, had been appointed to the Chair of Physiology at Prince of Wales's Medical College, Patna University, India. Dr. Reid, who is a graduate of Aberdeen University, succeeds at Patna University another Aberdeen graduate—namely, Professor E. W. H. Cruickshank, who has been appointed to the chair of physiology in Dalhousie University, Halifax. At the same meeting it was intimated that the number of full-time students attending the University during the academic year 1927-28 had been 1,344, including 792 men and 552 women, together with 49 part-time students.

Topics of Current Interest

THE UNITY OF THINGS

"Principalia non praeter necessitatem multiplicanda sunt." This axiom has held good in the limited sphere of clinical medicine for many generations, and no physician will willingly make two diagnoses where one will serve to cover the observed facts. When it comes to extending the same principle to a number of sciences, or to the whole universe, physician and scientist alike offer a far more cautious allegiance. This generation is experiencing a remarkable swing of the pendulum from the extreme concentration of

the last on the bacteriological aspect of disease, which seemed in the first flush of its discovery to offer so easy and satisfactory an explanation. Now epidemiologists have realized that the presence of a "causative" organism does not constitute a diseased individual, much less an epidemic. They find themselves exploring again the ideas of Sydenham, which 30 years ago seemed so quaint. The "epidemic constitution" includes far more than the bacterium and all the complicated reactions of the host; it takes account of winds and waters, of temperature

and humidity. Last week we had Mr. Kipling urging a distinguished medical audience—not quite ready yet to take him seriously—to include in their survey of the constitution a scan of the heavenly bodies. Now, in harmony with his concept, comes Sir William Bragg, reminding the audience at the Lloyd-Roberts lecture on Nov. 29th that the essence of Faraday's greatness and the basis of all his discoveries was his absorbing belief in the unity of Nature. From that belief and his singleness of aim to prove the underlying connection between gravity, electrical magnetism, chemical action, cohesion, light, and heat—to the scientist of his day all isolated forces—we owe the whole electro-magnetic theory of light and "wireless," electroplating, electrotyping, electrolysis, and innumerable other "everyday" processes of this age. Because of the tremendous consequence of Faraday's work upon our modern activities and outlook, his diary has a peculiar interest for men of science and laymen alike. As presented by Sir William Bragg, the day to day record of Faraday's laboratory experiments and results, a million words in all, became a living human document, enshrining the lovable enthusiastic personality by whom it was penned. Faraday would write down, in the neat spidery handwriting of his period, all that he thought he might do, all that he did; his many failures and his rare and thrilling successes. Peculiarly dear to the heart of Sir William Bragg was the little word "but," written in capitals and heavily underlined, which breaks a fortnight's sequence of hundreds of unsuccessful experiments. Using very often the actual materials which Faraday had handled, rescued from cupboards in the Royal Institution, the lecturer repeated before the eyes of his audience the very experiments which had led the great scientist to his epoch-making discoveries. Holding a bar of magnetised iron in his hand, he approached a coil of wire connected to a galvanometer, and everybody in the hall saw its needle quiver. "It looks simple, doesn't it?" said Sir William. "But it moved the world." It was the beginning of the dynamo. The famous "but" referred to the experiment establishing the connection between magnetism and light, and never was truer prophecy written than Faraday's note in his diary that day. "This fact will most likely prove exceedingly fertile and of great value in the investigation of conditions of natural force." This crucial experiment, too, the audience at the Royal Society of Medicine were able to see for themselves. In seeking for a connection between gravity, on the one hand, and light and heat on the other, Faraday was less successful, and he never knew how hopeless was his quest with the material at his disposal. Many intermediate steps were needed before Einstein could predict the deflection by the sun of the ray of light from a planet. This is the centenary year of the beginning of Faraday's diary, and the entries continue until 1862. Faraday, as Sir

William Hale-White pointed out in proposing a vote of thanks to Sir William Bragg, was a great lecturer and a great scientist, yet the world owes less to him for his experiments than for the spirit in which he performed them. The simplicity and single-mindedness expressed in his diary was a part of his whole life. The world of science has still something to learn from his message of unity in Nature. (*Lancet*, 2: 196, Dec. 8, 1928).

RECIPROCITY WITH NEW ZEALAND

At a meeting of the General Medical Council of Great Britain, held in London on November 27th, last, among other business the question of the relations between the mother country and New Zealand in the matter of the mutual acceptance of each others registration of medical qualifications came up. The situation in regard to New Zealand is of interest to us in Canada, for here also the question of reciprocity in medical qualifications has been under review, and several of our provinces, for reasons similar to those operating in our sister Dominion, we may infer, have abrogated the preexisting arrangement. [Ed.]

"New Zealand has, by recent legislation, raised a question regarding reciprocity which is receiving serious consideration. Hitherto, New Zealand medical degrees, under an agreement of many years' standing, have been recognized for registration in this country on the condition that all medical practitioners of Great Britain were registrable without further examination in the Dominion. By an Act of the Dominion Parliament, passed without notice to the Council, such registration in New Zealand is in future limited to practitioners who hold a medical qualification granted in this country. If this limitation were accepted it would mean that New Zealand graduates registered in the United Kingdom would be free to practise not only here but in all the British possessions and foreign countries with whom we stand in relations of reciprocity, but only certain practitioners on the British Register would have the like privilege in New Zealand. The Dominion Government suggest that a new arrangement might be made, by which the privileges of New Zealand graduates might be limited to the United Kingdom only. This would seriously affect the whole system of imperial and foreign reciprocity which has been established under the Medical Act, 1886, and we are advised that it would require new legislation amending that Act. A memorandum on the subject has been prepared for submission to His Majesty in Council, who has power to declare whether the New Zealand arrangements can be regarded as 'just' to the medical practitioners of the United Kingdom. If under the present law the new conditions are not held to be 'just' it will be for the Privy Council to order that Part II of the Medical Act, 1886, shall be

deemed no longer applicable to New Zealand. It is probable that the opinion of the law officers of the Crown may be taken on the scope and bearing of the Act as hitherto interpreted. If it proves that the Act does not admit the serious limitation proposed by New Zealand, the recent legislation in that Dominion will have to be amended, or New Zealand graduates must forego the advantages of British registration." (*Brit. M. J.*, 2: 241, Dec. 1, 1928.)

PREVENTIVE VACCINATION OF THE NEWBORN AGAINST TUBERCULOSIS BY B.C.G.

Calmette (*Brit. J. Tuberculosis*, 22: 161, Oct. 1928) remarks that Great Britain is one of the few countries which has not adopted vaccination of the newborn with *Bacillus Calmette-Guérin* (B.C.G.). Since the discovery of Koch's bacillus reliable vaccination has failed because we have not understood that tuberculosis immunity is different from the immunity developed against the majority of other microbial diseases, in that immunity against tuberculosis only results from the presence of some living tubercle bacilli in the body.

It is claimed that subjects only slightly infected and having only slight tuberculous lesions never develop a grave form of tuberculosis when infected anew, even though tubercle bacilli are introduced intravenously therefore, in order to make subjects resistant to virulent tubercle, we must first produce in them a tuberculous infection with as little virulence as possible.

Attempts have been made to utilize strains of bovine or human tubercle bacilli of normal or weakened virulence, but the difficulties and dangers are too great, therefore, one could only attempt preventive vaccination by the use of vaccine prepared from a bacillus artificially weakened. This condition was realized by obtaining an uninterrupted series of sub-cultures over 13 years of a virulent bovine bacillus grown on special medium (ox-gall). This organism, while still acting as an antigen, has lost the power of causing tuberculous lesions. It will not produce tuberculosis in a susceptible animal such as the guinea-pig. It has been named *Bacillus Calmette-Guérin* (B.C.G.), and is used for preventive vaccination in bovines and children.

It is demonstrated to be innocuous for animals such as the anthropoid apes and also its efficacy with regard to natural infection when healthy vaccinated animals are living in close contact with contagious tuberculous animals. The vaccine was also primarily given to a newly born child (six days), the tuberculous mother of whom had just died. Three doses of 2 mgm. were given at

intervals of 48 hours. The child is alive in perfect health, although for two years in a tuberculous environment.

The vaccine is prepared in the form of an emulsion so that each dose contains 400,000,000 living bacilli from a fresh culture (25 days old) in 1 centigram. It is given by mouth during the first three days following birth in three successive doses at 48-hour intervals in a small teaspoonful of milk.

From July 1st, 1924, to July 1st, 1928, 96,000 children have been vaccinated in France with B.C.G. It is claimed that the mortality is considerably less among the vaccinated than among the unvaccinated.

The Pasteur Institute has decided to place fresh emulsion of B.C.G. at the disposition of any of the medical faculty who desire to use it and the author is convinced that it may be used without the slightest fear. (Abs. E. G. Rawlinson, *J of State Medicine*, 36: 737, Dec. 1928)

INOCULATION OF PIRQUET-NEGATIVE PERSONS WITH B.C.G.

J. Heimbeck (*Tidsskr. f. d. Norske Laegefor.*, October 15th, 1928, p. 945) has, since May, 1926, inoculated 726 Pirquet-negative persons up to the age of 30 with Calmette's B.C.G. culture of living bacilli. This vaccine was given by subcutaneous injection, and as the original dose of 0.2 mg. frequently provoked local abscesses it was reduced to 0.05, and in some cases even to 0.02 mg. Among the 726 persons thus treated were 89 nurses whose Pirquet-negative reaction when they first joined the author's hospital showed that they were in grave danger of contracting tuberculosis from the patients they were about to nurse. Five of these nurses were inoculated in October, 1926, and their treatment in this way was so far unsatisfactory in that they had already nursed tuberculous patients three or four months before they were inoculated. There were 44 nurses in 1927 and 40 in 1928 who, as soon as they were found to be Pirquet-negative on entering hospital for the first time, were inoculated with B.C.G. For the next month or six weeks they were kept away, so far as was possible, from tuberculous cases. Only in 2 of these 89 cases did signs (pleurisy) of tuberculosis subsequently develop. One of these nurses was among the five who had been inoculated in 1926, and who had been exposed to infection for some months before the inoculation. The other nurse had been inoculated only for a month when she developed pleurisy. In the same two years, 1927 and 1928, there were 30 nurses who were Pirquet-negative when they joined the hospital, but who refused to be inoculated. Eight of these nurses

(27 per cent) subsequently developed signs of tuberculosis after having been in attendance on tuberculous patients. With regard to the nurses who were Pirquet-negative when they joined the hospital in 1924, 1925, and 1926, and who were not inoculated with B.C.G., it was found that 16 per cent of them had subsequently developed signs of tuberculosis. In none of the 726 Pirquet-negative persons inoculated with B.C.G. did this treatment provoke illness, but in as many as 53 cases abscesses formed at the site of injection. They were somewhat tender, but the discomfort was purely local, and there was no evidence of general constitutional disturbances. In eight cases guinea-pigs were inoculated with the pus from these abscesses, and none of these animals developed tuberculosis. The most effective remedy for these abscesses was quartz-lamp light treatment, which cured the largest abscess in a week. Heimbeck adds that the extension of Calmette's system (giving newborn babies B.C.G. by the mouth) to the subcutaneous injection of Pirquet-negative adults with this vaccine is the more important, since only a minority of human beings in an ordinary civilized community are infected with tuberculosis during childhood. He records his own mass Pirquet tests in support of this opinion, which, he admits, is not generally accepted. (*Brit. M. J.*, 2: epit, 89. Dec. 22, 1928.)

CONTROL OF MALARIA IN CENTRAL AMERICA

In presenting his sixteenth annual report* to the United Fruit Company which has immense activities in the development of Central America, Dr. W. E. Deeks, general manager of the medical department, admits that malaria is still their major problem. Dr. Deeks has himself contributed in no small measure, both by his own work and by the stimulating efforts of example, to the solution of the control and cure of the disease which stands across the progress of the company's work. In the present report the papers by Dr. O. T. Brosius, Dr. M. A. Barber, Dr. W. H. W. Komp, and Dr. N. P. McPhail on the special properties of quinine and plasmoquine in malaria are the most searching that have yet

appeared, based as they are on a vast clinical material. As a result of these studies, Dr. Deeks sets out his conclusions as follows: (1) Quinine is specific against the schizonts of all kinds of malaria and these are responsible for the clinical symptoms. In acute cases it is still the drug of election, but in order to obtain prompt results large doses (2-3 g. daily) must be given. (2) In acute cases the exhibition of quinine for short periods favours the appearance of gametocytes in the peripheral blood, either by driving the gametocytes from the deep viscera, or by creating an environment which causes the development of increased numbers of gametocytes. When developed under quinine administration gametocytes are viable. (3) Plasmoquine is mainly effective against gametocytes, but it has also a marked action in clearing the schizonts of the tertian and quartan types of malaria from the peripheral blood, while upon the schizonts of the subtertian type its action is negligible and apparently, as in Brosius's report it does not prevent the development of black-water fever. Moreover, it is not as effective in preventing relapses when administered alone as it is in combination with quinine. (4) Plasmoquine has a toxic action on crescents of subtertian malaria, and after a few doses mosquitoes feeding on infected individuals do not become infected. The use of plasmoquine thus, if this observation is confirmed, will be of great importance in malaria control. (5) If given in too large a dosage, or over too prolonged a period, plasmoquine may cause toxic symptoms. In a small percentage of cases there may be, as with quinine, an idiosyncrasy to the drug. The daily dosage should not exceed 0.06 g., and this should not be continued over a period of six days unless the patient is under close observation. (6) The toxic symptoms are headache, giddiness, gastric distress, and cyanosis, and the drug may cause death. At the onset of toxic symptoms there is a leucocytosis and degeneration of the erythrocytes. (7) The administration of quinine in combination with plasmoquine apparently prevents the development of toxic symptoms and because of this, and the therapeutic action of the two drugs on different phases of the parasite, they should always be given in combination in order to get the best clinical results. (8) Experience shows that for an adult the amount of quinine to be given daily in combination with plasmoquine depends upon the clinical symptoms. In chronic cases 1 g. daily will suffice; in acute cases 2-3 g. daily are necessary in order to obtain optimal results. (9) In ambulatory cases the daily dosage of plasmoquine should not exceed 0.04 g. in combination with 1-2 g. of quinine for a period not exceeding six days. Whenever possible all cases so treated should return for re-examination within three to four days after the course is completed. (*Lancet* 2: 1089, Nov. 24, 1928.)

* United Fruit Company, Medical Department, 17, Battery-place, New York, 1927, pp. 365.

COCKTAILS AND THEIR EFFECTS

The practice of cocktail drinking appears to be almost as prevalent in medical circles as in other society gatherings, and might therefore be supposed to have been condoned rather than condemned by the profession. We have, indeed, heard the custom defended by one grave authority on the plea that it was a stimulant to the endocrine system. In the current issue of the *British Journal of Inebriety* Professor W. E. Dixon of Cambridge describes the composition and effects of this American importation, which has largely taken the place of sherry and bitters or gin and bitters as an *apéritif* before meals. The cocktail usually consists of a solution of volatile oil, more rarely bitters, with vermouth and spirits, such as gin, whisky, or brandy. The most important constituent in each case is alcohol, the oils serving mainly as a mild irritant to the stomach. The spirit is very rapidly absorbed from the

empty stomach, and the rate of absorption is still further facilitated by the irritant action of the oils. Having reached the blood it is absorbed into the tissues, and especially the central nervous system, where it produces a stimulation of the nerve cells which continues until the tension of alcohol in the nerve cells and blood becomes equal, after which the alcohol exerts its ordinary action on the central nervous system. The action of the cocktail, unlike that of ordinary alcoholic beverages, is immediate, but its duration is transient, being limited to fifteen or twenty minutes at the most. This form of drinking, Professor Dixon maintains, is particularly pernicious for young people of either sex, who form a large percentage of cocktail drinkers, partly to lose their shyness and partly in a spirit of bravado. Not only does it impair their stomachs, but it helps to promote the habit of excessive drinking more than any other type of beverage. (*Brit. M. J.*, 1: 31, 1929.)

Abstracts from Current Literature

MEDICINE

An Electrocardiographic Study on 123 Cases of Diabetes Mellitus. Hepburn, J., and Graham, D., *Am. J. M. Sc.* 176: 782, Dec. 1928.

Electrocardiograms were made on 123 cases of diabetes mellitus. Significant electrocardiographic changes were shown in 56 cases or 45.5 per cent. Fifty-four of the 56 have been traced: 15 are dead; 10 died of vascular disease; 7 cardiac; 2 hypertension and intestinal hemorrhage, 1 hypertension and chronic nephritis with calculi and pyelitis. In all the patients dying of vascular disease the diabetic condition was under control by diet, or diet and insulin. Of the other 5 fatal cases; 2 died in coma (neither adhered to diet at home); 1 of acute pyelonephritis; 1 of lobar pneumonia; the other had acute hemochromatosis and may have died of cardiac failure. The ages of the 15 who died were all over 45, except one of the coma cases who was 27.

Twenty-three of the abnormal cases returned for electrocardiograms. In 15 cases the electrocardiogram had returned to normal; in 6 it was unchanged; in 2 cases the abnormalities had become more serious. Sixteen other cases with abnormal electrocardiograms are known to be alive. Two are suffering from hemiplegia, 1 from cardiac failure, 1 from pulmonary tuberculosis; the remainder are apparently well.

An analysis of the group with abnormal electrocardiograms would appear to show: (1) that in cases of diabetes mellitus suffering from vascular disease with signs of cardiac failure at

the beginning of diabetic treatment, the cardiac failure progresses despite the control of the diabetes mellitus; (2) that in diabetes mellitus cases without hypertension and showing no signs of failure at the beginning of treatment, the abnormal electrocardiogram returns to normal in a fair percentage of cases following effective treatment of the diabetes mellitus.

Group with Normal Electrocardiograms. — Sixty-seven cases had normal electrocardiograms at the beginning of treatment. Eleven had hypertension. Two cases have been lost sight of; 62 are living, 3 are dead. Chronic nephritis, peritonitis, and pulmonary tuberculosis each accounted for one of the deaths. Thirty-two cases returned for a re-check and in only one case was the electrocardiogram abnormal; this was a patient with severe diabetes who did not adhere to diet.

The authors are inclined to question the suggestion of Joslin that a high fat diet is a cause of vascular changes. They suggest that since the changes are chiefly in the intima of the vessels and the early changes are inflammatory in type that infection acting in the presence of abnormal metabolism is the chief cause of the vascular changes.

LILLIAN A. CHASE

A Study of Some Physiological Effects of Golf. Karpovitch, P. V., *Am. Phys. Education Rev.* 33: Nov. 1928.

An attempt was made to estimate the physical effects of golf upon convalescing patients at the Burke Foundation. The pulse rate, blood pressure, and the effect of a standard exercise

were measured before and after a game of golf. Three golf courses were used, two small ones and one larger one. The heart rate and blood pressure rise somewhat during the game, but after the game there is a decrease in both these in more than half of the cases, no change in a relatively small number, and a slight increase in the remainder. It is concluded that golf played as a non-competitive game has a beneficial influence in convalescing patients. Amongst the 90 patients were twenty cardiac cases who showed that when well-compensated they responded as normal people do.

H. SEGALL

Changes in the Fundus Oculi as a Definite Index to Arterial Disease. Agalston, S. A., *Arch. Int. Med.* 42: 455, Oct. 1928.

One hundred cases are analyzed and an attempt made to correlate changes in the retinal arteries with similar lesions of the viscera, particularly the kidneys and the brain. It is held that normal findings in the retinal vessels exclude sclerotic disease of renal or cerebral arteries. Emphasis is placed upon the recognition of early changes in narrowing and fading colour of the arteries with evidence of pressure upon neighbouring veins. These changes, before the development of an elevated blood pressure, may be accompanied by vascular catastrophe, especially cerebral or coronary thrombosis. From the observation of retinal vessels the suggestion is made that thrombosis of vessels is a much more frequent occurrence than rupture, which only occurs in small branches in the presence of very high blood-pressure. Marked peripheral arterio-sclerosis may occur without changes in the retinal arteries and such cases show no signs of visceral sclerosis. In cases exhibiting intermittent symptoms, fluctuating hypertension, claudication, etc., few sclerotic signs are seen in the retinae and in one such case (cited) transient spasm of a branch vessel with momentary blindness was observed to occur.

From the study of these cases, stress is laid upon incipient retinal changes and the close relation of organic disease of these vessels to visceral changes, alteration of blood chemistry, toxic conditions, and impending vascular accidents.

J. B. ROSS

A Case of Tetanic Spasm Resulting from Marked Dilatation of the Stomach. Zaevloschin, M., and Isakovitsch, M., *Odessa Med. J.* 3: 335, 1928.

This was the case of a woman, fifty-two years old, who had been treated for gastric ulcer, and who had suffered for twenty years from dilatation of the stomach. She died in the hospital in Odessa with tetanic spasms.

At the autopsy marked dilatation of the

stomach was found, so extraordinary, in fact, that the whole of the stomach had prolapsed into the true pelvis. The dilatation was due to a stenosis of the duodenum. Microscopically, a healed ulcer was found in this situation. No changes were found in the parathyroids, but marked alterations were found in the thyroid gland, suggesting a relationship between the thyroid and the condition of tetany.

A. G. NICHOLLS

SURGERY

A Review of Five Hundred Splenectomies with Special Reference to Mortality and End-Results. Mayo, W. J., *Ann. Surg.* 88: 409, Sept. 1928.

The spleen is part of the reticulo-endothelial system and is a hemolymph gland closely associated in function with the Kupffer cells of the liver. The cell in the spleen which corresponds with the Kupffer cell of the liver is a large mononuclear endothelial leukocyte exceedingly efficient in phagocytic action. The spleen has a "strainer" function, well exemplified in those splenomegalies in which the spleen is unable to deliver bacteria, protozoa, and toxic material with sufficient speed to the liver for destruction and detoxication. Removal of the spleen for traumatism in man, as well as in animals, does not seem to cause permanent abnormal disturbance.

The author reviews 500 cases of splenectomy with a total mortality of 10 per cent, the death rate being taken on those patients who died in hospital. Eighty per cent of the patients who recovered from the operation and are now living are in good condition. In 45 cases of splenectomy for splenomyelogenous leukæmia there were 3 deaths. Patients in this group have lived and have been able to work for a number of years, but, at no time has the blood become normal, yet great, and, in some instances, prolonged palliation has resulted.

Splenectomy was performed in 8 cases of lymphocytic splenomegaly with no deaths. Half of them apparently have been of a benign type and the patients are living from one to six years after operation. It was performed for splenic anæmia in 140 cases with 15 deaths while in hospital. More than half the patients are living, and all but six are in satisfactory condition. Ten per cent of the patients who died during the ten-year period after the operation for splenic anæmia died from gastric hæmorrhage.

In 88 cases of hæmolytic jaundice, 4 deaths followed the operation. Of the 81 patients traced, 73 are known to be living, of whom 72 are in good condition. This stands out as a life-saving operation in hæmolytic jaundice.

Splenectomy was performed in 27 cases of hæmorrhagic purpura, with 1 death. Of these,

26 are living and in good condition. It is important to make an accurate diagnosis before coming to a decision concerning surgical treatment, for aplastic anæmia simulates hæmorrhagic purpura, and differentiation may be very difficult.

In 62 cases of pernicious anæmia, there were 4 deaths in hospital after the operation. The author feels that the prolongation of life in 25 per cent of the cases was about two and a half times the life expectancy if splenectomy had not been performed. There were 9 cases of splenectomy performed for localized tuberculosis of the spleen. Seven of these patients have remained well over a long period of years. Syphilitic splenomegaly was represented by 10 cases and there was definite improvement in these resistant cases following operation and subsequent treatment amounted to cure. Septic splenomegalies are unsatisfactory cases for operation. Splenectomy performed for the relief of cirrhosis of the liver did not yield any better result than the Talma-Morison operation, which is performed with less risk.

Splenectomy was performed 7 times for Gaucher's disease. The 5 patients who lived were greatly improved and, although they were not cured, were able to work and earn a living.

R. V. B. SHIER

Recurring Ulcers Following Partial Gastro-tomy. Balfour, D. C., *Ann. Surg.* 88: 548, Sept. 1928.

The surgical treatment of peptic ulcer, as in other chronic lesions, is not always completely satisfactory. More radical surgical methods, in order to obviate disappointing results, have been advocated, namely partial gastrectomy. While it is the operation of choice for large perforated gastric ulcers, it does not appear to be a reasonable procedure for duodenal ulcers or for small gastric ulcers distant from the pylorus. The reason for advising partial gastrectomy in duodenal ulcer was based largely on physiological grounds, but it has now been proved that the operation does not necessarily insure perfect digestion, nor does it protect from subsequent ulceration, for several reports of recurring ulceration have appeared, the most comprehensive being that of Birgfeld, who classified 53 cases reviewed in the literature. He divided them into three groups: (1) 28 cases in which the ulcer was found at operation; (2) 20 cases in which a clinical or x-ray diagnosis was made, but, because of mild symptoms, the patient was not operated upon again; (3) 5 cases in which the subsequent course of the patient was either positive or very suggestive of recurring ulceration. Of the 28 cases in which operation was performed, 14 followed resection for gastric ulcer, 8 for persisting or reactivated duodenal ulcer, and 6 for gastro-jejunal ulceration.

Three of the cases followed resection of the Billroth I type, 6 followed resection of the Billroth II type, 10 followed sleeve resection, 7 followed a Polya operation, while 2 followed resection completed as an anterior end-to-side gastro-jejuno-stomy.

The causes of recurrent ulceration cannot be established, but the important factors would appear to be hyperacidity, operative trauma and technical errors, dietary indiscretions following operation, and foci of infection. The symptoms of recurring ulcer parallel those of the primary ulcer, but the pain varies greatly in situation, radiation and intensity, being usually more diffuse and more to the left and often radiates to the lower part of the abdomen. Pain radiating to the left shoulder in recurring ulcer is almost pathognomonic of perforation against the diaphragm. Fluoroscopic examination is a great aid in diagnosis. In 55 per cent free hydrochloric acid was found to be below normal, and in 26 per cent there was an absence of free hydrochloric acid.

The treatment of recurring ulcer is as a rule surgical. It is unwise to attempt a plastic operation or to employ the same segment of jejunum that was used at the primary operation. This segment is either resected or, if in good condition after the ulcer is excised, closed and a segment distal to the closure selected for the new anastomosis. The operation should be done without clamps or with clamps lightly applied. The new anastomosis should hang freely from the mesocolon. In the more intractable cases jejunostomy should be performed on the distal loop for the administration of nourishment and fluids during the first few days following operation.

For recurrences following a Billroth I type of resection, posterior gastro-enterostomy should have first consideration. If this is inadvisable, a reasonable amount of stomach should be resected and a posterior Polya operation is advisable. For recurrences following a Billroth II or a posterior Polya operation, the anastomosis is first mobilized, the site of the ulcer identified and a segment of the stomach, the entire anastomosis, and enough of the jejunum to remove all inflamed tissue, are resected. Following this, a new anastomosis is made, the mesocolon being sutured to the stomach well above the anastomosis. Ulcers entirely in the jejunum, on the mesenteric side or in the distal loop, are either excised or the segment of jejunum is resected. If the ulcer is in the proximal loop of the jejunum and almost inaccessible because of a short loop, there is a fair chance that the lesion will heal if the new anastomosis is made 7 or 8 cm. distal to it. It may be that the ulcer is so awkwardly situated, and the inflammatory process so extensive and so acute, that temporary jejunostomy will

permit the inflammation to subside and in these cases temporary jejunostomy constitutes an excellent procedure.

The results of operation in these cases of recurrent ulcer after partial gastrectomy show the presence of a very intractable disease. It should be remembered that partial gastrectomy as a primary operation for benign peptic ulcers does not afford assurance that ulceration will not recur.

R. V. B. SHIER

PÆDIATRICS

Pyuria in Children: Use of the Cystogram.

McKhann, C. F., *Am. J. Dis. Child.* 36: 2, 1928.

The frequency with which long-standing pyuria in infants and children is associated with congenital malformation of or organic changes in the kidneys, ureters, bladder or urethra necessitates, in many instances, recourse to instrumental investigation before an exact diagnosis can be made and effective treatment instituted. Cystoscopy and ureteral catheterization, on account of the difficulty of the procedure, attendant trauma, frequency of reactions and necessity for general anæsthesia, are not free from danger in infants and young children. Accordingly, urologist and pædiatrist are agreed that cystoscopy be resorted to only after a long period of observation during which all the simpler diagnostic methods are employed.

Cystography is a very valuable procedure as a part of the routine examination of patients with pyuria. By its use, abnormalities of the bladder and ureters may be demonstrated, in such cases often giving as much information as could be derived from cystoscopy and rendering further investigation unnecessary. The cystogram may prove a useful adjunct where cystoscopy is inadvisable; it may give indication for an immediate cystoscopic examination; it may demonstrate the possibility of treatment by lavage.

The procedure is carried out as follows: With the patient on the x-ray table, a 12.5 per cent solution of potassium iodide is slowly injected into the bladder through a catheter as large as practicable, after removing any residual urine. When the intravesical pressure begins to cause discomfort, the catheter is clamped and the roentgenograms are taken, after which the potassium iodide is withdrawn and the bladder irrigated with boric acid solution. With this technique, the procedure is done quickly, without anæsthesia and with no danger of shock.

In the normal subject the cystogram shows only the outline of a well-filled bladder. In about 20 per cent of children with pyuria of

long duration the cystogram shows reflux of the opaque solution into one or both ureters; sometimes in addition the ureters are seen to be dilated and the kidney pelvis clearly defined.

Cases are reported in which the procedure proved a most useful diagnostic measure, the youngest patient cited being a girl of five months. X-ray plates showing unilateral and bilateral ureteral reflux, dilated and kinked ureters, and abnormal kidney pelves, are reproduced.

A. K. GEDDES

DERMATOLOGY

Interdigital Ringworm Control Among Students.

Sharp, W. B., and Taylor, E. K., *J. Prev. Med.* 2: 485, Nov. 1928.

It is now generally recognized that ringworm about the toes is an extremely common affliction, trifling in nature, but causing discomfort and disablement by irritation and odour. There is a very wide prevalence of this type of ringworm, both in the United States and in Canada; in Galveston, Texas, for example, it is said that 60 per cent of the population are affected during the summer bathing season.

The authors have made some investigations to determine how the infection is spread amongst students. It has been stated that the infective fungi are usually picked up by walking barefoot in gymnasium buildings. But a careful comparison of two groups of students, one of which was accustomed to walk barefoot on these floors, and the other which did not go about these buildings at all, revealed the fact that there was nearly as much ringworm in the latter group as in the former. It does not seem therefore, that much improvement in the prevalence of the infection may be expected from special sanitary measures with regard to floors.

Nor do the authors seem enthusiastic about any treatment being able to completely eradicate the disease amongst the great mass of students. Whitfield's ointment gave very good results as a rule but recurrences were frequent amongst those who could be watched. The treatment had often to be repeated a number of times.

It is a problem in itself to reach the infected students. A point should be made of looking for the disease in routine physical examinations, special attention being given to the interdigital spaces. The well marked seasonal occurrences which has been noted suggests that the fungus lies dormant in the cutaneous folds of the feet during the winter months, and becomes active in the warm weather on account of the increased heat and moisture of the parts.

H. E. MACDERMOT

THERAPEUTICS

Continued Administration of Iodine and Other Salts. Henzlik, P. J., Talbot, E. P., Gibson, E. E., *Arch. Inter. Med.* 42: 579, Oct. 1928.

Except in conditions of thyroid hyperplasia, simple goitre and a few other metabolic changes, the objections to the long-continued administration of iodides are not founded on sound evidence. Experiments were conducted on normal rats and upon a few rats rendered rachitic by diet. The salts used were sodium iodide, sodium sulphocyanate, arsenic (in the form of Fowler's solution, U.S.P.), sodium borate, thallium acetate, sodium bromide and manganese. Observations were carried on for four years covering from one-seventh to seven-twelfths of the life span of the animal used. The dosage of iodide corresponded to $3\frac{1}{2}$ grains daily for an adult man weighing 70 kilos. It was found that the rats receiving iodide showed a gain in weight and growth over varying periods, amounting to 10 to 15 per cent as compared to the controls, and in direct contrast to all the rats receiving the other salts; these showing a varying diminution of weight and food consumption, arsenic and thallium causing death. A similar tendency to gain under iodide therapy was seen in rachitic rats on a deficient diet. Those animals receiving bromide showed a loss of weight overproportionate to the lowered food consumption. The indications are that small doses of iodide over long periods have a beneficial effect on weight and growth of normal animals, this being in accord with observation made upon cattle and pigs by other writers. It is not contested that large doses of iodide have a stimulating effect on general metabolism with accompanying loss of weight. The doses used were those corresponding to clinical administration and considerably in excess of amounts ingested by the use of iodized table salt.

J. B. ROSS

On the Treatment of Leukæmia by Injections of Malarial Parasites. Andring, C., *Odessa Med. J.* 2: 7, 1927.

Observations on the care of persons suffering from myeloid leukæmia and malaria at the same time have shown that fever notably lowers the high leucocyte count; also, qualitatively, the blood is improved, since the number of myelocytes is also diminished. This has caused certain workers, notably Rosenow, Gamble and Lucherini, to test the treatment of leukæmia by injections of malarial parasites. Their experiments bear out the observations above recorded. Unfortunately, the effect is only transient, as when the febrile attack is over the leucocyte-count gradually rises.

In the case that the author reports, a patient

with myeloid leukæmia had a leucocyte count of 620,000 per cmm. After inoculation with malaria, during the incubation period of 14 days, the number of leucocytes sank to 440,000. Eight attacks of ague reduced the count still further to 229,000. This level remained fairly constant for fifteen days during the administration of quinine, then began to rise and in twenty-two days more had reached the figure of 648,000.

A. G. NICHOLLS

Mort subite par injection de novocaine-adrenaline dans la région amygdalienne. (Sudden death following the injection of novocain and adrenalin into the tonsillar region). Mayoux, R., *Ann. de Mal. de l'Oreille*, 47: 6, June 1928.

The patient concerned was a working girl, twenty years of age, strong and without obvious defects, who had been the subject of severe attacks of sore throat. Her tonsils were very large and full of crypts, and it was proposed to remove them.

At ten a.m., a considerable time after her usual light breakfast had been taken, the throat was lightly sprayed with novocain, 1 to 20. Then, 8 c.c. of novocain (2 per cent), together with 1 c.c. of adrenalin (1 to 1,000) were injected into both tonsillar regions. The little operation was well borne, and the patient was sitting at one side of the room. After five minutes she suddenly fell to the floor, her face pale, and with some convulsions of the upper limbs. Respirations ceased; the cardiac pulsation, felt at first, weakened and then quickly stopped. Artificial respiration was started immediately, with rhythmical traction on the tongue, and subcutaneous injections of ether were administered. This was followed by an intracardiac injection of 1 c.c. of adrenalin (1 to 1,000). None of these measures sufficed to revive her.

No explanation of the fatal result was forthcoming. There is, up to the present, no way of foreseeing and preventing such distressing results. The cases recorded have usually been in young persons without defects or important organic lesions. Generally speaking, also, the doses employed of the anæsthetic have been less than the amounts usually considered dangerous.

A. G. NICHOLLS

ANÆSTHESIA

Discussion on Late Ether Convulsions. Hadfield, C. F., and others, *Proc. Roy. Soc. Med. Anæsthetic Section*, 21: 33, Aug. 1928.

Ether convulsions were not known until three years ago. They may cause death on the operating table, or may recur and kill the patient after he has been put back in his bed.

The late Dr. S. R. Wilson investigated the cause of these convulsions and attributed them to the presence of acetaldehyde and peroxide in the ether. These bodies are absent from good anæsthetic ether when the containers are first opened, but soon appear and increase rapidly in quantity under the conditions to which ether is subjected in the operating room; yet ether convulsions are very rare. Peroxides are very slightly volatile and so are unlikely to cause convulsions. Aldehydes, however, are even more volatile than ether. Dr. Hadfield has been able to demonstrate by experiment that some ethers, when warmed and subjected to a stream of oxygen and nitrous oxide, rapidly form aldehyde and peroxide. Various theories have been advanced to explain the convulsions but none are satisfactory.

In the discussion of Dr. Hadfield's paper Dr. Z. Mennell drew attention to the fact that a large proportion of the patients who developed convulsions were anæsthetized by means of oxygen blown through ether.

W. B. HOWELL

Anæsthesia for Thyroidectomy: A study of Different Methods for Anæsthesia Used in Four Thousand Goitre Operations. DeCourey, J. L., *Brit. J. Anæst.* 6: 40, July, 1928.

Local anæsthesia, though satisfactory to the

operator and his assistants, is seldom satisfactory to the patient. The psychic shock is severe and the operation takes twice as long. Nitrous oxide and oxygen provide the best anæsthesia. Ethylene was tried in the writer's clinic and discarded. It was found to have no advantage over nitrous oxide and oxygen. Its chief objection is its unpleasant smell. Everyone connected with the surgical team complained of persistent headache after being present at two or more ethylene anæsthesias. Vomiting was more severe than after gas and oxygen. One patient vomited incessantly for three days. The functional type of cardiac arrhythmia often disappears during a carefully conducted anæsthesia. The organic types either do not improve or get worse. Arrhythmias of the "pulsus alternans" type require close watching, since they indicate myocardial change. Patients with this condition are likely to succumb promptly if there is a fall of blood pressure associated with an increased pulse rate. When pulsus alternans develops during operation some digitalis preparation should be given intravenously. Among four thousand operations for removal of the thyroid gland, at the DeCourey clinic, there was only one death, and that was due to a wound of the jugular vein.

W. B. HOWELL

Obituaries

Dr. Francis J. Shepherd, Emeritus Dean of the Faculty of Medicine, and for more than thirty years Professor of Anatomy in McGill University, passed away quietly and suddenly on the morning of January 18th, in his 78th year. Few professors leave a memory more deeply enshrined in the hearts of their students than does Dr. Shepherd, and no one has enjoyed a higher reputation among his confrères for sound judgment, professional skill and lofty ideals.

After spending one year in the Faculty of Arts, Dr. Shepherd in 1869 entered on his life's study in the Faculty of Medicine McGill University. Even at that time McGill as a School of Medicine stood preeminent on the continent owing to the high reputation of its professors, to its demand for four years' study, and to the thorough practical bedside training given by it. Graduating with high standing in 1873 in a class which contained many brilliant names, Shepherd crossed the sea to Europe for two years' further study in the hospitals of London, Paris and Vienna. In Vienna he joined two other graduates of McGill holding high records, George Ross, who graduated in 1866, and William Osler, who graduated in 1872, both of whom were then "walking the hospitals," and attending the clinics of the brilliant teachers who at that date made Vienna the chief medical centre in Europe.

On his return to Montreal, Shepherd was at once given the position of Demonstrator of Anatomy in the University, a position for which, while he was yet in Europe, he had been asked to qualify. He came out after study of the various methods of teaching anatomy in the best schools in Europe with very

definite views, and on the death of Professor Scott he was made full professor, and introduced promptly the most modern methods of teaching that important subject. As a result, since then, McGill students have been everywhere recognized as men "who knew their anatomy."

The school at that time had a number of young men on the teaching staff who under the leadership of William Osler deeply interested themselves in the advancement of the students, and we note that in 1877 an undergraduate medical society for mutual information and discussion was formed with William Osler as President, George Ross as First Vice-president, and Francis Shepherd as Second Vice-president. For many years Shepherd took an active part in its meetings. The same statement may be made regarding the Montreal Medico-Chirurgical Society, which had taken on new life under the stimulation of the same group of brilliant and earnest men.

For many years Dr. Shepherd was also connected with the *Montreal Medical Journal*, and prepared with much care a monthly retrospect of surgery with critical remarks of his own. This retrospect was much appreciated, and afterwards appeared in volume form.

In 1883 following the resignation of Dr. Osler, Dr. Shepherd was appointed Honorary Librarian and temporary Registrar of the Faculty of Medicine. In the same year he was elected as full surgeon to the Montreal General Hospital, and shortly after his appointment commenced a course of summer clinics for the benefit of those students who remained in town at work in the hospital during the summer months.

In 1905 he was invited to attend the Fourth Centenary Celebration of the Foundation of the Royal College of Surgeons in Edinburgh, and when there he was made the recipient of the Honorary Fellowship of the College, and had the degree of Doctor of Laws conferred upon him by the University.

About this period in addition to his purely surgical work, Shepherd began to devote his attention to diseases of the skin, a subject which while in Vienna he had studied under Hebra, and in this department did pioneer teaching in Canada and in 1907 he was named as Vice-president of the Dermatological Congress held that year in New York, and in 1928 was made President of the Canadian branch of the British Dermatological Society.

In 1908 he was tendered a complimentary banquet on the completion of his twenty-five years as professional head of the Section of Anatomy in the University, by his past and present assistants on the teaching staff, and was by them presented with a fine silver coffee service. Dr. H. S. Birkett was chairman on this occasion.

In 1913 Dr. Shepherd was chosen to act as Vice-president of the Department of Surgery in the International Medical Congress in London. Honours at this time began to pour upon him. The degree of Doctor of Laws was conferred upon him by Harvard University in 1906, by McGill in 1915, and by Queen's University in 1919. The much prized honour of the Honorary Fellowship in the Royal College of Surgeons of England followed in 1913, and later in 1914, the Honorary Fellowship of the American College of Surgeons. He was also elected corresponding member of the Société Internationale de Chirurgie of Paris, and foreign member of the American Academy of Arts and Sciences. In April, 1923, on his attaining his fiftieth year after graduation, he was tendered another banquet by his former house surgeons and demonstrators of anatomy. On this occasion he was presented with a fine piece of Georgian silver. The following year his numerous friends in the profession presented him with a portrait of himself by Miss Des Clayes, which now hangs in the large hall of the Medical Building of McGill University along with the portraits of previous Deans.

When the Canadian Medical Association was affiliated with the British Medical Association, Dr. Shepherd was made an Honorary Life Member of the latter Association.

Dr. Shepherd throughout his lifetime was a keen supporter of art, and especially of the art of painting, in which for many years he was regarded as an authoritative critic. He was President of the Montreal Art Association from 1906 to 1910, and in 1918 he was again persuaded to take that position, which he was still occupying at the time of his death. Only recently, at a special function, in the Montreal Art Gallery, on

the occasion of his 77th birthday he was presented with a bronze bust of himself by a circle of his friends in the Association.

For many years he was a member of the Board of Trustees of the National Gallery at Ottawa and recently Chairman of the Board, where he rendered invaluable service to the cause of art in Canada. He clearly appreciated the enormous value to a country of collections of fine art in which the best obtainable examples should be hung for inspection, and be serviceable, not only for educational purposes but for the increase of national pride in art, and as a stimulus to all who may be able to enrich their country with further valuable examples.

Dr. Shepherd will always rank as one of the eminent graduates of McGill for his ability as a teacher, for his professional skill, and for his services as counsellor in the affairs of the two large Montreal hospitals, and of the University. To a remarkable

degree he influenced his confrères in the profession, not only by the definite way in which his opinions were stated but by the general conviction of their justness and his honesty.

In a paragraph on Dr. Shepherd in the daily press Dr. Martin, Dean of the Faculty of Medicine in McGill University, is quoted as follows:—"Dr. Shepherd as surgeon and anatomist was a recognized authority on two continents. Possessed, moreover, of extensive general knowledge he represented the very best type of intellectual growth among the graduates of McGill University. Up to the last he retained his mental integrity, and was continually consulted in matters pertaining both to hospital and university. Few men were respected as was Dr. Shepherd by his colleagues in the medical world. His death leaves a gap in our community and in the Dominion that will not easily be filled."

A. D. BLACKADER

AN APPRECIATION

The death of Dr. Shepherd removes one of the most outstanding figures in Canadian medicine. A man of independent thought and action, his strong personality exerted an influence which left an indelible mark, not only upon his students but upon the evolution of medical education throughout Canada. Those of us in a sister University who often enjoyed the advantage of meeting him in conference, where problems of common interest were discussed, recognized in Dr. Shepherd a man of strong conviction, sincere and "down-right" in the expression of his opinions, and possessing the qualities of good judgment and common sense to an exceptional degree.

His force of character made itself felt upon his associates; it commanded their respect and many times determined their action. In the years of his retirement from active duty, while his counsel and advice were no longer available in official gatherings, yet many of us sought his society in private and invariably came away with fresh inspiration and a strong desire



Dr. Francis J. Shepherd
(From a painting by Alphonse Jongers)

to cumulate the fine qualities of mind and heart which he possessed.

Those of us who were his personal friends enjoyed to the full his kindly greeting and his loyal support and sympathy. He filled a large place in our affection and esteem and the blank created by his death is incalculable.

A. PRIMROSE

AN APPRECIATION

Only a few days ago I had my Christmas letter from Dr. Shepherd. He hoped to see me at the Canadian Medical Association meeting in Montreal next summer, when he was to give the first Oslerian address. And now comes the news of his sudden death, and I am asked to write an obituary notice. This is not an easy task. Dr. Shepherd was for many years a kind, thoughtful and helpful friend to me, and the wound is fresh.

It may not be generally known that Dr. Shepherd began his medical studies at Dalhousie. He was spending a few months' holiday with friends in Halifax at the time the medical school was opened, and it was probably then that he decided to study medicine. His name is among the earliest enrolled.

At McGill his personal character, his intellectual gifts, his high and earnest spirit, marked him as a leader among his fellows. He had like-minded associates, and McGill owes much of her character and success to these. I cannot name all, but I recall a portrait in Harvey Cushing's *Life of Osler* showing a triumvirate of young and earnest, and, I think, merry men, but looking solemn in the preposterously tall silk hats then in vogue. The men have passed, but their work endures. They were, George Ross, William Osler and Frank Shepherd.

We all know that Dr. Shepherd had the soul of an artist. This must have given direction, colour, and design to all his work. As a young anatomist and surgeon he soon showed in the scope and arrangement of his museum that he had the spirit of John Hunter. I often think of him as he stood and saw the work of thirty years going up in flames when the museum was destroyed.

Shepherd was a great teacher. His alertness of observation, his thoroughness in diagnosis, his attention to detail, must have inspired many of his pupils. They still inspire in their work many of his old students scattered throughout the world. These inspirations and ideals do not die. They come from the Eternal; they accomplish the work designed for them to do, and they return to their Source. Life is endless.

JOHN STEWART

Dr. Clarence L. Starr died at his home in Toronto on Christmas night after a short illness.

The death of Dr. Starr came with startling suddenness. A few of his intimate friends knew of his

serious illness, but no one thought the end was near. In fact his medical attendants hoped that after a few months' rest he might be able to resume work. Forty-eight hours before his death, symptoms suddenly appeared which indicated that a fatal issue was inevitable and he succumbed to the final attack of angina on the evening of Christmas Day.

He was a distinguished graduate of Medicine of the University of Toronto (1890), and a member of the teaching staff for thirty years. He also held the degree of M.D. from the Bellevue Hospital Medical School, New York. In 1921 he became the first full-time Professor of Surgery, and, at the same time was appointed Surgeon-in-Chief to the Toronto General Hospital. Previously he had been Chief Surgeon in the Hospital for Sick Children. On his assuming the duties of the Chair, he completely re-organized the Department of Surgery. The department under his direction was recognized not only within the University as thoroughly efficient but many distinguished visitors from various parts of the world were so impressed that they expressed their admiration of his achievement in no unstinted fashion. In 1926, he was invited to Harvard University where he temporarily occupied the Chair of Surgery, and within the last few weeks, he was asked to occupy a similar position in St. Bartholomew's Hospital, London. He had hoped to

spend a few weeks in that capacity during the summer of 1929.

During the war he rendered most valuable service both overseas and at home. With the rank of Lieutenant-Colonel, he was Surgeon-in-Chief in the Granville Special Hospital at Ramsgate, England, and later exhibited splendid organizing ability in connection with similar work at the Christie Street Hospital, Toronto.

He was a Fellow of the American Surgical Society, and Vice-President of that body at the time of his death. He was also a Past-President of the American Orthopaedic Association and an Associate member of the British Orthopaedic Association. McMaster University conferred on him the degree of LL.D., *honoris causa*.

He was a most popular colleague, beloved and respected by all his associates. He was born at Georgetown, Ontario, on July 1, 1868. Surviving him are his wife, daughter of the late Hon.

John Dryden, and four daughters; one brother, who is in the medical profession and lives in Corning, N.Y.; and a sister who lives in Brooklin, Ont. To his widow and family we wish to convey our heartfelt sympathy.

A. PRIMROSE



Dr. Clarence L. Starr

Dr. Maurice MacDonald Seymour, of Regina, died suddenly on January 17, 1929. He was born at Goderich, Ont., on July 7, 1857, and received his early education at Assumption College, Sandwich, Ont. He

graduated in medicine from McGill University in 1879, and received the Diploma of Public Health of Toronto University in 1917, and the LL.D. of Ottawa University in 1927.

After practising for two years in Winnipeg, Dr. Seymour moved to the west when the Canadian Pacific Railway line was completed, and practised at Fort Qu'Appelle until he removed to Regina in 1906. He was medical officer to the Indian Reserves, now in the Qu'Appelle district, and to the Indian School at Lebret from 1886 to 1906. In 1885 he became surgeon to the 95th Battalion (Manitoba Grenadiers), and with this unit served through the Riel Rebellion.

Dr. Seymour was always most active in matters professional and in everything that pertained to the public welfare, and held many important positions. Among them may be mentioned: Supervisor of Public Health for Saskatchewan, under the Department of Agriculture (1906); first Commissioner of the Bureau of Public Health (1909); first Deputy Minister of the Department of Public Health, on its creation in 1922. He became President of the Canadian Public Health Association in 1913, and Governor and Vice-President of the American Public Health Association in 1922. He was elected President of the State and Provincial Health Authorities of North America in 1926. In 1906 he organized the Saskatchewan Medical Association.



Dr. Maurice MacDonald Seymour

In 1923 Dr. Seymour was requested by the League of Nations to represent Canada on the Health Section. Together with representatives from eighteen other countries he assisted in making a Health Survey of the United States, after which he attended a meeting of the League at Geneva. Another of his important public activities was the founding of the Saskatchewan Anti-Tuberculosis League.

Dr. Seymour was superannuated in 1927, but acted still as Public Health Advisor to the Provincial Government, and succeeded, in 1928, in having legislation passed for the organization of full-time Health Districts or Units. At the time of his death he was Honorary President of the Regina and District Medical Society. Dr. Seymour performed the first laparotomy in what is now Saskatchewan.

Besides being a great organizer, Dr. Seymour was a man of varied gifts and charming personality and enjoyed the esteem of all with whom he came in contact.

He is survived by his second wife, who was a Miss A. H. Fallow, of London; and by three sons, Maurice, Harold, and Arthur.

LILLIAN A. CHASE

Of Dr. Seymour the Hon. J. M. Uhrich writes as follows:—

The sudden death of Dr. M. M. Seymour, former Deputy Minister of Public Health, is a great shock to me. Closely associated with him as I have been during the past seven years, I am in a position to value and appreciate his many excellent qualities better, perhaps, than most men, Dr. Seymour's outstanding ability as a Public Health official, his capacity for detail and administration, his social and cultural gifts, together with his untiring energy, made his services of the greatest value. His splendid contribution to public health work will be felt for many years to come in the province he served so long and faithfully.

Dr. A. R. B. Williamson, who died on December 24th in his fifty-third year, was born in Kingston, where he spent his life. Educated in the public school and collegiate institute, he passed into Queen's University where he graduated B.A. in 1895; M.A. in 1896, specializing in chemistry. In 1899 he graduated in medicine and then served for a year as interne in the Kingston General Hospital. In 1900 he went to London, where he immediately sat for examinations and was granted the



Dr. A. R. B. Williamson

M.R.C.S. (Eng.) and the L.R.C.P. (Lond.). After a year in the London hospitals he returned to Kingston and began the general practice which he continued till his death. He was on the staff of the Medical Faculty and Hospital throughout his career, teaching chemistry at first, later obstetrics and gynaecology. For many years he was head of the Department of Obstetrics. He was Secretary of the Medical Faculty, and Medical Health Officer for the City of Kingston. His general practice was probably the largest in the city. He was skilled in general surgery, a successful operator, and as a consultant was much in demand among his colleagues in and about the city. He was a member of the Board of Examiners for the Canada Medical Council since its formation in 1912. This is a short statement of a remarkable life, filled with service to the community, in which he was greatly loved and respected. He was the friend of all his colleagues, the friend of his students, and the friend of all his patients. Although in failing health for several years he preferred to continue his

usual routine as long as it was possible to do so. He met his fate with great courage and equanimity and for months past estimated accurately the progress of his malady and its certain termination. Dr. Williamson was a great man, a great physician, an excellent teacher, but above all he was the friend of all humanity.

J. C. CONNELL

Dr. D. D. MacTaggart died in Montreal on January 4th, in his sixty-seventh year, after a short illness. Of Highland Scotch ancestry, he was born near Woodstock, Ontario, on August 26, 1862. His early education was obtained at the Montreal High School, and, after spending two years as surveying clerk for the Grand Trunk Railway, he entered McGill University, taking the degrees of Bachelor of Applied Science in 1891 and Doctor of Medicine in 1896.



Dr. D. D. MacTaggart

About thirty years ago Dr. MacTaggart became one of the pathologists at the Montreal General Hospital, and after the death of Dr. Wyatt Johnston in 1902 he succeeded him as the medico-legal expert for the district. He was associated with the teaching of medico-legal pathology at McGill as early as 1900 and became Professor of Medical Jurisprudence in that institution in 1911. Up to two years ago Dr. MacTaggart was the English-speaking medico-legal expert at the Montreal morgue, and attained widespread fame for his profound knowledge of his subject. He was frequently associated with important trials involving medico-legal points, notably the Delorme case.

In his early days Dr. MacTaggart was passionately fond of athletics and outdoor sports. He was amateur two-mile running champion of Canada for three years, and in 1884 won the cross-country championship of America. Besides these, he won many trophies for snowshoe and other races, winning enough medals to serve him as a coat-of-mail.

Dr. MacTaggart had a long and honourable connection with the militia of Canada. For many years he was medical officer of the First Regiment Canadian Grenadier Guards. He was gazetted major in 1905 and was placed on the Reserve List in 1911. At the outbreak of the War he was called up and specially employed in the medical service of Military District No. 4. He was promoted to the rank of Lieut.-Colonel in 1917.

For nearly two years, up to 1918, he was president of the Standing Medical Board for the examination of recruits, and after that date was president of a special medical board of revision, which was the final court of appeal in regard to the fitness of men for military duty. He was transferred to the Reserve of Officers in 1924, on re-organization.

AN APPRECIATION

Nothing perhaps expresses the tribute due to Donald MacTaggart more forcibly than the fact that it will be extremely difficult, if at all possible, to fill his chair of Medical Jurisprudence at McGill University. He was the chair, and for years held it and taught his subject entirely by a peculiar happy combination of personal and academic qualities which successfully overcame lack of funds and equipment, local and personal difficulties incident to his branch, and a general want of public interest and support of his specialty.

MacTaggart's interest in legal medicine was first aroused by his early association with Wyatt Johnston, and he thus acquired a very thorough technique and knowledge of pathological anatomy. These were linked to a very straight and sane judgment, to which fantastic and involved interpretations always remained foreign. He never went off at tangents. To these qualities he owed his well-known reliability and reputation as legal expert. They made him an excellent witness who was not easily misled by shrewd cross examinations, for he avoided the cliff upon which ever so many medical witnesses founder—the distinction between fact and assumption—and he based his opinions strictly on facts and experience.

But his greatest accomplishment in his chosen field will always be his effort to establish "civil medical jurisprudence" as a scientific expert field. In this respect he really did pioneer work of high order and to it he devoted the best energies of his later years. Shortly after I came to Montreal, he talked to me frequently about his plans which, as he properly saw, would acquire greater and growing importance by the progress of modern society, in compensation acts, soldiers' re-establishments, accident and life insurance, sanitary police regulations, etc. He had a thorough knowledge of advances in these respects in European countries, and it was his ambition to cultivate and teach this branch of legal medicine as a connected whole and as a basis of social medicine. A great idea and an ambitious scheme! While MacTaggart did not entirely succeed in these efforts and did not reach the level which he originally planned, it was largely due to circumstances and obstacles over which he had no control. For such a scheme would, in its entirety, have required not only a much more generous academic and professional support than was available, but also legislation, legal and social recognition, and changes of procedure quite different from current practices, in other words, really revolutionary movements. Nevertheless, MacTaggart carried his plan further than I thought it possible under the circumstances, and the soundness of his plan is daily more apparent. Bench and bar certainly came to value and respect him as an expert in civil cases.

When the new Pathological Institute at McGill was built, his department was accorded quarters in it, a fact which immensely delighted him, for he saw himself "taken off the street" and his subject substantially recognized. He had once more great hopes for a re-organization of his department and a more intimate

contact with the coroner's office and other legal machinery. But human fate is more tragic than any drama. He never came to fully enjoy his new quarters. They had hardly been finished when he was overtaken by a frightful streptococcus septicæmia, following upon a finger infection, from which he really never quite recovered. His strong physique and grim determination carried him along for awhile, but he himself appreciated that his strength was gone. He became morose and pessimistic, and talked for the first time of retirement.

Our respective fields and common interests first drew us together in a professional way, and closer contact made us friends. His friendship was of rare order, with fine "Highland" characteristics.

As one grows older, contemporaries and friends drop away, to be no more, but some continue with us and remain as fresh in our mind as they ever were while they walked by our side. And with the sadness of the personal loss, there is perhaps this consolation that in memory weaker sides of the man vanish while what was best in him shapes itself in greater relief and finer form. Thus, Donald MacTaggart will remain with me!

HORST OERTEL

Dr. D. B. Cameron, of Oshawa, died on January 11th, following a heart attack. Dr. Cameron was well known in this section of Ontario as a sport enthusiast in rugby and hockey. He was about forty-eight years of age. His widow and seven children survive. He came from Cochrane.

Dr. A. Emile Dumont, Collector of Inland Revenue

at Shawinigan Falls, died at his home on December 20, 1928.

Dr. D. W. Ross. The death of Dr. D. Wellington Ross, of Fredericton, occurred on Christmas Eve, following a short attack of pneumonia. Dr. Ross was a native of Peel, N.B. He received his education at the public school at Peel, the Provincial Normal School at Fredericton, and McGill University, from which he graduated in 1894. He practised at Florenceville, Marysville and Fredericton. Dr. Ross took an important place in public affairs, especially in civic politics. He was a Past-president of the Board of Trustees of the Victoria Hospital, Fredericton. He was also a member of several fraternal organizations. At the time of his death he was First Vice-president of the New Brunswick Medical Association.

Dr. Malcolm Slack died at his home in Farnham, on January 8, 1929. Dr. Slack was born in Montreal 50 years ago, and was a son of the late George F. Slack. Although born in Montreal, when very young his father moved to Farnham where he spent the whole of his professional life. He was educated at the local school and Seth Mills School at Brigham. He entered McGill University later and graduated in medicine in 1903. Then he went to Edinburgh, where in 1907 he received the diplomas of L.R.C.P., L.R.C.S., and L.F.P. and S. On returning to Farnham he practised medicine until the time of the war when he entered the Canadian force and was made a captain in the medical division in France.

News Items

GREAT BRITAIN

Sympathy with the King

At its meeting on December 12th the Council of the British Medical Association, before proceeding to business, adopted a resolution, proposed from the chair, expressing in loyal terms the deep sympathy of all the members of the Association with their Patron the King and the Royal Family, and their earnest hope for His Majesty's early and complete recovery.

Sir Hector Cameron

During the last days of November the veteran Sir Hector Clare Cameron, Dean of Faculties and Emeritus

Professor of Clinical Surgery in Glasgow University, died full of years and honours at the age of 85. One of the last survivors of Lord Lister's personal assistants and coadjutors—he has fitly been described as Lister's "beloved disciple"—he held a high place not only among Glasgow celebrities, but in the affectionate regard of the surgeons of the world.

Sir Ernest Rutherford, Cavendish Professor of Physics in Cambridge University, and formerly Professor of Physics at McGill, has been awarded the Albert Medal of the Royal Society of Arts "for his pioneer researches into the structure of matter."

NOVA SCOTIA

During December a rather unusual prevalence of diphtheria and scarlet fever was reported from several parts of the province. The cases were mostly of a mild type, and the mortality was low. At the end of the month a mild form of influenza was quite general throughout the province.

The little community of L'Ardoise, Richmond County, has long been noted for the longevity of its people. In December last, the centenarian group was depleted by the death of two persons, each of whom had attained an age of more than one hundred. The funeral services were held on the same day. At least one centenarian remains, a lady of one hundred and two years, who is reported to be active and in excellent health.

While the fourth wife of Laban Wagner, of New Canada, Lunenburg County, was assisting her husband at haymaking last July, she was unfortunate enough to fall and break an arm and a leg. She was carried to

the house and laid on a couch. Her husband refused to call medical aid, but was considerate enough to rub the injured limbs with "spavin cure." Recently, however, he decided to have a doctor called. Some publicity followed, and the attention of the S.P.C. was directed to the matter. That organization instituted legal proceedings against Wagner. The case has been dealt with by the Magistrates' Court, which committed Wagner to stand trial before a higher court. Meantime Wagner is "out on bail."

Some months ago, action was brought against Miss Mary Watson, the Superintendent of the Yarmouth Hospital, and the Hospital Society by a former patient of the hospital. The plaintiff asked for \$10,000.00 damages for injury to mind and body which he attributed to negligence. It was also charged that Miss Watson had probed a sinus when dressings were being changed. At the trial, which extended over four days, the evidence of medical men as to the effect of the probing was con-

flicting. Great interest was taken in the trial by the people of Yarmouth, and the interest was possibly increased when the court found it necessary to adjourn before the case was disposed of, and it was announced that the argument of counsel would be heard at Halifax in December. On the resumption of the trial before Mr. Justice Carroll, the arguments of counsel continued during three sessions of the court. Judgment was reserved.

On account of the embarrassment caused by the action referred to above, Miss Mary Watson tendered her resignation as Superintendent of the Yarmouth Hospital. Her friends would not allow her to leave without tangible evidence of their regard for her, and arranged a farewell reception at the Grand Hotel where, it is estimated, more than a thousand people attended to say good-bye. The Hospital Society presented Miss Watson with an address expressive of the confidence and esteem in which they held her, and accompanied the address with a small casket containing twenty twenty-dollar gold pieces. Most of the physicians residing in the constituency served by the hospital joined in the presentation of a very handsome diamond ring, while the Ladies' Aid presented a beautiful bag. A few days later, Miss Watson was guest of honour at a banquet tendered by the Provincial Society of Graduate Nurses, held at Halifax.

On Monday evening, December 3rd, a Reunion of the members of No. 7 Stationary Hospital, C.E.F. (Dalhousie Unit) was held at the Carleton Hotel in Halifax. There was a large attendance, between sixty and seventy officers, non-commissioned officers and other ranks, as well as seven or eight Nursing Sisters who had served overseas, being present. Colonel John Stewart, who commanded the unit at the time of its organization in 1915, at Shorncliffe, and later in France, and Colonel E. V. Hogan, who succeeded to the command and brought the unit home in 1919, were both present. The guests of the evening were Major-General G. Lafayette Foster, C.B., and Colonel H. A. Chisholm, D.S.O., C.M.G. General Foster was D.G.M.S. during the latter part of the war and Colonel Chisholm, D.D.M.S., both of the Canadian Force Overseas.

Early in December Dr. Norman Harris, of the Federal Department of Health, made an investigation of the sanitary condition of the clam beds of the province from which shipments are made to the United States, and reported that none show evidence of infection.

Dr. A. C. Jost, formerly Provincial Health Officer of Nova Scotia, has been appointed Executive Secretary of the State Board of Health of Delaware, with headquarters at Dover.

Dr. J. C. Webster, of Shediac, N.B., recently lectured before the United Service Institute of Halifax, on "The rise and fall of Louisburg." Dr. Webster is well known for his keen interest in history, and for much valuable research in the early history of Canada. Of late years he has been endeavouring to awaken interest in the preservation of the historic remains at Louisburg, and present indications are that his efforts are soon to be rewarded by concerted action on the part of several interested organizations.

Dr. Evan Kennedy, of New Glasgow, one of the veterans of the Nova Scotia profession, recently had the misfortune to sustain a fracture of the leg.

Dr. E. D. MacLean, of Truro, who has not been in good health for some time, has gone to California for the winter. All who know the genial doctor will unite

in hoping that he will soon be quite restored and return in the spring to resume his practice. W. H. HATTIE

The 76th annual meeting of the Medical Society of Nova Scotia will be held in Pictou on June 24, 25, and 26, 1929, the headquarters being at Pictou Lodge, the C.N.R. summer hotel, which will officially open June 27, 1929, for the season.

The best wishes of every doctor in Nova Scotia follow Dr. and Mrs. Hattie, who left January 16th for a three months' stay in Citronelle, Alabama. For some fourteen months he has been confined to the house, most of the time helpless in bed, suffering from arthritis. Only for the past month has he been able to take up some of his many duties in connection with the Provincial Medical Board, the Medical College, and other organizations with which he is connected. This enforced vacation of his has been long overdue and we hope he will make it sufficiently long, and come back fully restored to health, for men of his stamp are of great value to a country and we would keep them as long as possible.

Dr. H. A. Chisholm, Halifax, recently of the Provincial Health Department, has been appointed to the Dominion Immigration Service. Accompanied by Mrs. Chisholm, he sailed for England on the *S. S. Arabic* on January 14th. They will take up their residence in London, at which centre, it is understood, Dr. Chisholm will have charge of the medical inspectors at the emigration ports. Their four children will remain here at school for the present, joining their parents later.

The present building of the Inverness Memorial Hospital is found to be insufficient to provide accommodation for all who seek admission. It is proposed to erect a new building, to be connected with the present building, and to convert the present building, with the exception of the operating-room section, into a residence for nurses.

A number of cases of smallpox have been reported from Shubenacadie and the neighbourhood. Nova Scotia has been practically free from smallpox for several years. A rather widespread epidemic followed the introduction of the disease by workmen who came from other provinces to assist in reconstruction after the Halifax disaster of 1917. This led to a fairly general vaccination and with a considerable proportion of the population protected, the disease soon disappeared. Since then an occasional imported case has been discovered, but in every outbreak prior to the present spread has been prevented. In the present instance, infection is said to have been introduced into a somewhat isolated district by a visitor from Ontario.

The discovery of cases of trichinosis at New Waterford has led to an investigation, which has disclosed the prevalence of the disease among pigs kept by foreign-born residents of the neighbourhood. Early in January four human cases had been discovered, one of which resulted fatally. Dr. A. S. Kendall, Medical Health Officer of the municipality of Cape Breton County, and Dr. J. K. MacLeod, Health Officer of Sydney, issued warnings to meat dealers and householders not to purchase fresh-killed pork without first determining its point of origin. As health authorities and agricultural interests are both actively concerned in the matter, it is anticipated that there will be no further spread of the disease. S. L. WALKER

NEW BRUNSWICK

On January 8th, Dr. William Warwick, Medical Officer of Saint John District, inaugurated a series of public health talks, broadcast from Station CFBO Saint John. These talks will be a feature for several weeks and will occur on Tuesdays.

The present influenza epidemic has apparently singled out physicians for special attack. Many of the men throughout the province have been ill, among whom may be mentioned Dr. Stanley Bridges, of Saint John, who is slowly recovering from an influenzal pneumonia.

A committee of the New Brunswick Association is at present redrafting the scale of fees for the province, and is also suggesting amendments to the code of ethics.

A report of the Saint John County Hospital has recently been given to the press. It shows an increase in the number of patients treated during the year, a reduced per diem cost for maintenance, and a very healthy condition of finances, largely due to the provision of \$1.00 per day per patient for the Tuberculosis Hospitals allowed by the Provincial Government.

It is being strongly pressed upon the Government that there is a great necessity for an institution to treat tuberculosis on the north shore of New Brunswick. This area is becoming increasingly French and it is felt that it is only just that an institution be

placed in this neighbourhood and probably under French auspices.

Recent appointments to the staff of the General Public Hospital of Saint John included Dr. Howard Bustin, who received a medical appointment, and Dr. R. Hughes who was appointed to the Nose and Throat Department.

During the last year two of the senior physicians, Dr. J. M. Barry and Dr. W. E. Rowley, resigned from their appointments on the medical staff of the General Public Hospital, Saint John.

Negotiations have been progressing between the Committee of the New Brunswick Medical Society and the Workmen's Compensation Board. A report of their conclusions will shortly be forthcoming.

Dr. M. J. Sproule, of Cornwall, Ontario, was a recent visitor to Saint John.

Dr. G. G. Corbet, of Saint John, has been recently elected President of the local Saint John Ambulance Association.

Dr. Thomas F. Sprague, of Woodstock, is convalescing following a severe and protracted illness.

Dr. H. S. Everett, of Saint Andrew's, N.B., has returned from a visit to the New England States.

A. STANLEY KIRKLAND

QUEBEC

About ten thousand patients were treated at the Hotel Dieu Hospital, Quebec, during 1928. To be exact there were 10,395 patients, of which number 4,323 were bed patients, remaining a total of 78,633 days, or an average of 18 days per patient. The other 6,072 were treated at the dispensary.

The St. François d'Assisi Hospital treated 996 patients during the year, while the St. Sacrament Hospital accounted for 2,500 patients.

A by-law authorizing the Board of Management of the Montreal Dispensary to borrow funds from Le Credit Foncier Franco-Canadien to the extent of \$15,000 at 6 per cent per annum, for a period of five years, and to mortgage the real estate and immovable assets of the corporation as security, was approved and passed at a meeting of the governors and subscribers held in the dispensary recently. Louis S. Colwell, President, occupied the chair, and members of the executive and officials present included Dr. H. B. Carmichael, Honorary Secretary; H. P. Douglas, and J. Wolferston Thomas, Vice-President; Dr. A. Grant Fleming, Dr. George A. Brown, and Dr. A. Bramley Moore. Many old subscribers were present also. The President held proxies for 75 per cent of the governors and subscribing members.

Prominent in the recently arranged Stratheona Ethnological Museum in the McGill Medical Building, which has just been opened to the public, is one of the comparatively few remaining specimens of a particular Indian art, a huge totem pole with a length of nearly thirty-two feet six inches. This pole was given to McGill by the late Dr. Buller of Montreal, and when first brought to the Redpath Museum at McGill, 18

inches of the massive specimen had to be cut off before it could be placed in the building. Few historical data regarding the pole are available. It is known to come from the Queen Charlotte Isles, but no other information regarding its early construction or possible first location is available. Apparently, it has been made out of a large split and hollowed log, one half of which was carved in the usual Indian style. The figuring extends the full length of the pole, which is surmounted by the figure of a small bear.

A strong plea for the continuation of educational work in the combating of venereal disease is made in the annual report of Dr. A. H. Desloges, Medical Director, in dealing with the operations of that division of the Provincial Bureau of Health for 1927, which will be tabled by the Provincial Secretary at the session of the Quebec Legislature opened recently. A call on the Government for funds is made in the significant words "More than ever our Government should realize that it is only through their financial help that we can possibly attain our aim, which is the education of the public and the sterilization of those who are infected. While the figures of venereal disease treatments for 1927 are rather alarming at first glance, with 11,205 new cases, out of a total of 30,897 during the 12 months, it is pointed out that this does not mean that venereal infection is progressing. The disease is held, on the contrary, to be on the decrease, and the increased attendance at clinics and treatment centres, of which there were 64 in the province during the year, is considered to be, due to the better education of the people in hygiene. In 1927, there were approximately 125 treating physicians, who gave 160,624 treatments and consultations, aided by two laboratories, six serologists and bacterio-

logists, three technicians, and three assistants. There were 27,668 Bordet-Wassermann reactions carried out, and 34,548 examinations and analyses made. Regret is expressed that insufficient attention was given during the year to the placing of children in families, and the introduction to this section of the report closes with the paragraph: "As in our hospitals for the insane, I hope that a complete reorganization of our reformatory and industrial schools will soon take place. The result will be that the children placed in the different institutions will later be in a better position to earn their living." Dealing with the hospitals for the insane, the

report of Dr. Desloges, shows that the population of these institutions at the end of 1927 was 7,905, an increase of 386 cases during the year, during which there were 2,029 admissions and 978 patients released on probation. Of these, 337 were still on probation as on December 31st.

Dr. E. W. Archibald, Professor and head of the Department of Surgery, McGill University, has been appointed Surgeon-in-Chief to the Royal Victoria Hospital, Montreal. GEORGE HALL

ONTARIO

Dr. F. S. Vrooman, Ontario Hospital, Mimico, is the President of the Ontario Neuro-Psychiatric Association and Dr. Geo. C. Kidd, Rockwood Hospital, Kingston, Ontario, is the Secretary for 1929. GEORGE C. KIDD

Complimentary Dinner to Dr. Goldie

A delightful dinner was held at The York Club, Toronto, on the evening of January the fifth, when, on the invitation of Professor Duncan Graham, over fifty members of his Department of the Faculty of Medicine in the University of Toronto gathered to honour Dr. William Goldie, who resigned from the Associate Professorship of Medicine at the beginning of the present academic year.

In a few well-chosen remarks the Professor of Medicine paid a glowing tribute to his teacher and colleague who for thirty-one years has laboured so earnestly and so successfully in the interests of his University. Reference was made to the active interest taken by Dr. Goldie, in association with a few other graduates, in the University troubles of 1905, which ultimately resulted in the revision of the Constitution of the University. Dr. Goldie was also very intimately associated with the re-organization of the Faculty of Medicine some ten years ago. By placing the clinical departments on a more academic basis and by obtaining an adequate endowment fund to endow chairs and research, the Medical Faculty had been given greater opportunity to foster research and develop its personnel. Dr. Graham drew attention to the four years spent by Dr. Goldie in pathological study and his ten years as chief of the Infectious Division at the Hospital for Sick Children. This laboratory foundation and early training broadened his viewpoint and was a potent factor in his unusual success as a teacher and consultant.

Dr. Graham then paid personal tribute to Dr. Goldie as one who had aided him in many ways. Dr. Goldie had always been a tower of strength to the

younger men; in fact, by insisting upon the acceptance of his resignation while still many years short of the "age limit," he had given practical proof of his conviction that the young men should be given more and earlier opportunity to attain responsibility and promotion.

In replying, Dr. Goldie modestly disclaimed the high encomium of his "Chief." Having previously enjoyed his host's bachelor parties, he had readily and unwittingly accepted this invitation, for it was not until the hook had been well baited and taken, that the barb was sent home. In a happy and reminiscent vein, he recalled his early days in pathology when he received \$150.00 per annum for full time work, out of which stipend \$200.00 was paid to his boy assistant! Dr. Goldie emphasized that not only he personally but the whole University owed a deep debt of gratitude to the great leaders of medicine in Toronto, making special mention of Reeve, Peters, J. E. Graham, Cameron, Primrose, and McPhedran. "I have seen such men courageously standing up for their principles and ready to take criticism and sink their self-interest for the benefit of the Faculty—and one of the greatest examples of this spirit is our present Chief." Dr. Goldie eulogized the efforts of Professor Graham to give the young men every opportunity and referred to the present Department as one of his "dreams come true, a dream which should go on forever."

Dr. Graham expressed regret also, that several other members of the Department of Medicine had found it necessary to relinquish their appointments, and made reference to the work of Dr. King Smith, Assistant Professor of Medicine in charge of Dermatology, who retired after many years of faithful service, and to that of Dr. Thos. J. Page, Dr. Leonard Murray, Dr. Harvey Agnew, Dr. E. S. Jeffrey, and Dr. M. J. Wilson. Regret on leaving the Department and well wishes for its continued success in the future were expressed by each of the physicians named.

MANITOBA

Hon. T. A. Burrows, Lieutenant-Governor of Manitoba, was operated on successfully for appendicitis at the Winnipeg General Hospital at midnight on December 11th.

Dr. E. S. Moorhead, of Winnipeg, has been appointed Chairman of the Welfare Supervision Board of Manitoba. This Board recently recommended to the Minister of Public Health that a sanatorium for tuberculous patients, especially children, be built on a site in or near Winnipeg.

Dr. N. J. Maclean attended the recent meeting of the Western Surgical Association.

Dr. T. Glen Hamilton, of Winnipeg, gave a most interesting lecture on "Psychical research" at the Brandon Mental Hospital on December 3rd.

The latest revised copy of the regulations of the proposed College of Physicians and Surgeons of Canada was discussed and reviewed by the Medical Faculty of the University of Manitoba at a meeting held January 3rd.

Dr. G. S. Fahrni presented a communication on "Bird banding" before the Scientific Club of Winnipeg on January 8th.

ROSS MITCHELL

SASKATCHEWAN

The last regular meeting of the Regina Medical Society was celebrated with a dinner at the Hotel Saskatchewan, at which Drs. C. E. Tran, F. J. Waugh, R. Stripe, J. Creighton, and Sahlmark, who are also members of the local legislature, were guests of honour.

Dr. O. E. Rothwell gave a paper on "The patient with abnormal mental symptoms." He drew attention to the fact that there is little or no accommodation for psychopathic patients in the local hospitals.

The matter of a Victorian Order nurse for Regina was discussed and it was decided to have a representative of the Order present at a future meeting.

Dr. T. Walker, of Saskatoon, was asked to address the Society on the work of Lister, on April 5, Lister Day.

The secretary was instructed to confer with the Druggists' Association in regard to having the Sunday service extended and to have an all night service in one drug store each night.

The executive appointed a committee to go into the whole matter of legislation regarding the drugless practitioners. This committee will report at an early date.

Six new hospitals were completed in Saskatchewan in 1928; one at Tisdale (St. Therèse) 36 beds; Bosthern (St. John's) 22 beds; Gravelbourg (St. Joseph's) 40 beds; Oxbow (Community) 10 beds; Ile à la Crosse, 15 beds; and Arcola (Union) 10 beds.

Additions were made to the following hospitals: Regina General, 75 beds; Saskatoon General, 104 beds; Moose Jaw General, 65 beds and 20 babies' cots; Moose Jaw Providence, a \$225,000 annex; Indian Head, 10 beds; Humboldt, 25 beds. Yorkton has started a \$50,000 addition, and Rosetown has passed a by-law to provide a \$60,000 addition.

A new Tuberculosis Sanatorium for between 150 and 200 patients has been commenced at Prince Albert. A by-law has been carried to build a Union Hospital at Wilkie; and a Red Cross outpost was opened at Rabbit Lake.

Pre-school examination conferences were held at 91 places throughout the province last year, at which 3,464 children were examined. These conferences are organized by the Department of Health, but the local doctors co-operate by giving their services.

Dr. R. R. Roger was appointed President of the Regina Grey Nuns' Hospital staff at the annual meeting held on Jan. 17, 1928. Dr. F. A. Corbett is Vice-president and Dr. J. G. Wright is Secretary. Additional members of the executive are, Drs. J. V. Connell, E. T. French, and J. B. Trudelle.

At the first meeting of the Regina City Council in the new year the by-law regarding the Board of Governors of the Regina General Hospital was changed to include only four aldermen and the mayor. Formerly the Board consisted of the mayor, four aldermen, the city commissioner, a medical man, and two other citizens.

LILLIAN A. CHASE

Dr. Loban, recently an interne in Saskatoon City Hospital, has bought the drug store in Neville and is engaged in practice at this point.

Dr. Wheeler, who formerly practised at Neville, is now in St. Boswells, where he is also running a drug store.

Dr. Taylor, of Winnipeg, is at present associated in practice with Dr. McVicar at Vanguard. Dr. McVicar has recently installed a complete electrotherapy and light treatment equipment. He is leaving for the east to spend some time in post-graduate work.

Dr. P. J. McCue, of Gull Lake, is confined to his house through illness, but is expected to be able to resume practice shortly.

Dr. Storey, of Shaunavon, who has been associated with Drs. Swanston and Lee for some years, is now engaged in private practice in Shaunavon.

OSCAR M. IRWIN

ALBERTA

The new wing to the Holy Cross Hospital, Calgary, is now nearing completion. This fine structure has been erected at a cost of over four hundred thousand dollars and will contain ninety beds. It will be thoroughly up to date in every particular, containing, besides public and semi-private wards, private suites. There will be a solarium on each floor. An autopsy room with an amphitheatre for didactic purposes will be a welcome addition, since in neither of the Calgary hospitals have there been adequate facilities for the proper conduct of an autopsy. The very latest type of refrigeration plant will be installed. A large assembly hall for the nursing staff will be an added feature in this splendid addition to the hospital. It is now barely thirty-five years since this hospital was founded by the Grey Nuns of Montreal. To-day they have one of the finest and best equipped hospitals in Western Canada.

Dr. A. F. Anderson, one of Edmonton's best known physicians, has been appointed to fill the vacancy of Superintendent of the Alexandra Hospital in this city, vacant through the death recently of Dr. Harry R. Smith.

A new municipal hospital has been officially

opened at Grand Prairie, containing forty beds. This institution should meet the requirements of the Peace River District. It is just another evidence of the growth of this area. In 1927 the Peace River produced enough wheat to feed all Western Canada from the Lakes to the Pacific, for a whole year, and with extension of railways and further settlement increasing at a rapid rate, it will soon be able to feed all Canada. It is interesting to note that though the district is comparatively new the residents have not hesitated to support the municipal hospital idea.

For a number of years the town of Stettler and district have had the question of a municipal hospital before the voters. Each time the proposal to erect such an institution has been defeated. At last, however, the measure has gone through, and a contract will soon be awarded for a suitable building. There is no doubt but that with such progressive medical men as there are in Stettler, this hospital will render a much needed service to the community.

Can a doctor be compelled to answer a call? This is a question that is generally answered by the laity in the affirmative, though as a matter of fact the correct answer is "No." Recently the College of

Physicians received the following resolution from the United Farmers of Alberta:

"Whereas there is considerable sickness going in this district and it is almost impossible to get a doctor to come out to see a patient in the country after they have been called, regardless whether they are able to pay for the call or not."

"Please send me rules governing doctors going to the country from towns and cities in this province when they are called."

To this resolution and letter the Registrar informed the writer that no doctor was obliged to answer any call except on the obligation of his conscience to render services whenever and wherever he could, but that while the members were under no legal obligation to the community, the profession in Alberta rendered over one million dollars' free services in 1927, an amount in dollars and cents greater than any of our annual Provincial Health Department budgets in Alberta prior to 1928. Why should any community expect the doctor to take the financial responsibility for the care of the indigent sick, because he has the knowledge, any more than expect the merchant to furnish food and fuel to the indigents because he has both in stock?

It is expected that the by-law in Calgary to apportion twelve hundred and fifty thousand dollars for the erection of a new municipal general hospital will be voted on early this year. The proposed hospital will contain three hundred beds and will be built adjacent to the present building. If the by-law is passed the present hospital will be converted into a Nurses' Home.

It seems that in various parts of the province hospital accommodation is wholly inadequate and much new space is required, hence the agitation for much larger and up-to-date commodious buildings. In Lethbridge there is a proposal to erect a three hundred thousand dollar hospital, to take care of the needs of forty-five thousand residents of the town and adjacent territory.

Dr. H. B. Wickware has moved from Huxley to Byemoor, which leaves the districts of Huxley and Elnora without a physician, where formerly there was one in each of these places.

Dr. A. W. Bowles, who formerly practised in Gleichen, has returned to Alberta after a year's absence, during which time he pursued post-graduate studies in England.

Dr. W. J. Torrance has returned from England where he spent the past year in post-graduate work. He has decided to practise in Vancouver.

Dr. J. W. Crawford, a graduate of the University of Alberta in 1927, has been appointed to the staff of this institution.

The sympathy of his confrères is extended to Dr. A. E. Talbot of Calgary, who recently was bereaved through the death of his wife.

Dr. J. Bowlen has returned to his home in Calgary after several years of absence. After his graduation from the University of Kentucky he spent three years in hospital and in post-graduate work in New York and London. He is now acting as locum tenens for Dr. Griffin of Strathmore.

Dr. W. H. McGuffin, of Calgary, recently entertained the members of the medical profession of Calgary, on the occasion of the opening of his new addition to the Radium and X-ray Institute. The Calgary Medical Society will hold their meetings in the large assembly room.

G. E. LEARMONTH

The January meeting of the Academy of Medicine was held in the Medical Building, University of Alberta, on January 16th.

The retiring President, Dr. J. F. Folinsbee, gave a report for the past year which indicated that the affairs of the Academy were in a flourishing condition.

Reports were given by the retiring Secretary and Treasurer.

Dr. Heber Jamieson gave an illustrated and most interesting paper on the Medical History of Edmonton and surrounding district from the earliest days of settlement up till 1900 A.D., in which he sketched the careers of many old timers of our profession who figured prominently as pioneers, a few of whom still survive.

The newly elected President for 1929, Dr. N. L. Terwillegar, presided for the first time at this meeting. He has to assist him the following officers:

First Vice-president, Dr. R. G. Douglas; *Second Vice-president*, Dr. B. R. Mooney; *Treasurer*, Dr. Harold Orr; *Secretary*, Dr. J. G. Young; *Executive*, Drs. Allan Day, A. B. Cameron, and Norman Allin.

Dr. A. F. Anderson, one of our prominent and most active physicians for many years, has been appointed Superintendent of the Royal Alex. Hospital in place of Dr. H. R. Smith recently deceased, and will take up his duties on February 1, 1929.

Dr. Luc Le Bel who has practised for some time at Lac La Biche has removed to Edmonton where he has recently opened an office.

Dr. L. A. Miller formerly of Westlock, Alta., has removed to Edmonton where he will now practise, after taking post-graduate work in Edinburgh and Vienna.

F. H. WHITELAW

BRITISH COLUMBIA

It will not be out of place to congratulate Mr. P. Walker on his recent appointment as Deputy Provincial Secretary in the new government. Mr. Walker, during his many years as Chief Clerk in that department, was ever sympathetic to the profession, and many doctors in country districts now receiving government grants have Mr. Walker to thank for his influence in this connection.

The British Columbia Medical Association has recently completed a survey of all medical industrial contracts in the province. This has been done with a view, not of interfering with any existing satisfactory con-

tracts, but to improve those which are not so satisfactory, if possible, and give practical advice in the case of new contracts.

It is probable that Health Insurance will be a live issue in the Provincial Legislature at the forth-coming session, and it is interesting to note that the British Columbia Medical Association has appointed a strong committee, under the chairmanship of Dr. J. H. MacDermot, to study the question, and to be in a position to keep the profession informed of any steps that may be taken by the Legislature. We have on hand a

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valuable aggregation of data on this most important subject.

The British Columbia Medical Association takes this opportunity of congratulating the Vancouver Medical Association on the excellence of its publication *The Bulletin*. It is no mean task for a local association to issue month by month a journal which, for breezy news of general medical affairs, local and provincial, would be difficult to beat, whilst the clinical articles continue to be of the best. Our Executive Secretary reports that he receives many encomiums from doctors throughout the province, who assure him that the *Bulletin* has filled a long-felt want.

A large framed print of the Council of the Royal College of Surgeons, England, presented by Dr. A. Wynter, of Bristol, England, was accepted by the Vancouver Medical Association, and a vote of thanks sent to the donor. The picture is hanging in the Board Room of the Vancouver General Hospital until the Association moves into its new quarters in the Medical and Dental Building.

The Eye, Ear, Nose and Throat Section of the Vancouver Medical Association this winter inaugurated a new plan to keep the Section alive and make the meetings worth while. Fortnightly luncheons are held in the private dining room of the Hudson's Bay Company, and four speakers, chosen alphabetically, are notified that they may be called upon for a five-minute talk. The subjects must be submitted to the Chairman of the Section three days in advance of the meetings, so that proper discussion may be arranged. At the meeting on December 14th the section had the privilege of a talk from Dr. McCool, of Portland, Oregon, on "Some personal observations on ophthalmic surgical technique." We learn from Dr. Ainley that the attendance at these meetings so far has been in the neighbourhood of 90 per cent.

We understand that Dr. R. E. Coleman is resigning his position as Assistant Director of the Vancouver General Hospital Laboratories on the 1st of January, 1929, after being associated with that institution for thirteen years. It is the doctor's intention to open a laboratory in the city. We note his resignation with great regret. His keen interest in his work has helped to build up an institution upon the help of which we call daily, without, perhaps, much thought of the labour

involved in the demands we make upon it. We wish Dr. Coleman every success in his new venture.

The annual dinner of the Vancouver Medical Association was held at the Hotel Vancouver on November 29th. It was a very successful and pleasant function, as all who attended it seemed to think.

If we may judge by a Christmas card recently received from London, England, Dr. Lewis Smith is still enthusiastic over his last trip to Canada last summer. The card contains a snapshot of the genial Doctor and Mrs. Smith on the beach at Campbell River with the 53½ lb. Tyee salmon which he landed during the last day of his visit there, and his pride is evidenced by the broad British smile. We hope to welcome Dr. Smith in Vancouver again, both as a fisherman and as a lecturer.

Dr. Lyall Hodgins addressed a meeting of the Fraser Valley Medical Society on December 11th, at the Royal Columbian Hospital, New Westminster. His subject, "Dyspepsia," was dealt with in a most interesting manner, and at the close of his talk a good deal of discussion was entered into by the members present.

Dr. J. E. Knipfel, late of West Vancouver, is now practising at Extension, Vancouver Island.

Dr. R. E. Ziegler, of Campbell River, is taking two months' post-graduate work in the east, and his practice is being cared for by Dr. W. H. Moore, of Victoria.

Drs. E. L. McNiven and W. H. Moore, of Victoria, have been recommended to membership in the Canadian Medical Association.

Out-of-town visitors to Vancouver during the Christmas holiday season included: Dr. H. B. Maxwell of Ladysmith; Dr. A. Francis of Hedley; Dr. A. E. Wilson of Port Alberni; Dr. E. L. Garner of Duncan; Dr. G. E. Darby of Bella Bella; and Dr. D. W. McKay of Nelson. All these visitors called at the business office of the British Columbia Medical Association, where many problems were discussed.

Twelve applications for membership in the British Columbia Medical Association were approved last month by the Credentials Committee. C. H. BASTIN

UNITED STATES

The Prevalence of Influenza

For the week ending December 22, 1928, 252,016 cases of influenza were reported to the United States Public Health Service, as compared with 141,000 for the previous week. As probably only one-fifth of the cases are reported, the estimated total of the cases existing would be 1,260,000. There were 710 deaths from influenza reported for the week, as compared with 475 for the previous week. The death rate indicates that the type of disease has been unusually mild. Surgeon-General Cumming states that more than 500,000 deaths occurred in the epidemic of 1918; about 100,000 in that of 1920; and about 18,000 in that of 1926. From the indications it is likely that the mortality rate for 1928 will be higher than that for 1926.

Action Regarding Class C Colleges

For the last several years an increasingly large number of state medical licensing boards, according to official reports, have refused recognition to several medical schools rated in class C, so that at present

diplomas issued by such institutions do not entitle their holders to practice medicine in forty-six states and in the territory of Alaska.

By a recent vote of the Council on Medical Education and Hospitals, therefore, it was decided that only those medical schools which have been granted a rating higher than class C will be named among institutions recognized as medical schools. This ruling applies to the

Chicago Medical School.

College of Physicians and Surgeons, Boston.

Middlesex College of Medicine and Surgery, Cambridge, Mass.

Kansas City University of Physicians and Surgeons.

The charters of two other class C institutions, the Kansas City College of Medicine and Surgery, and the St. Louis College of Physicians and Surgeons were revoked by court action, respectively, June 23, 1926, and May 23, 1927, on the charge that they had been engaged in the sale of medical diplomas. Two other institutions were chartered, evidently as sub-

Ayerst

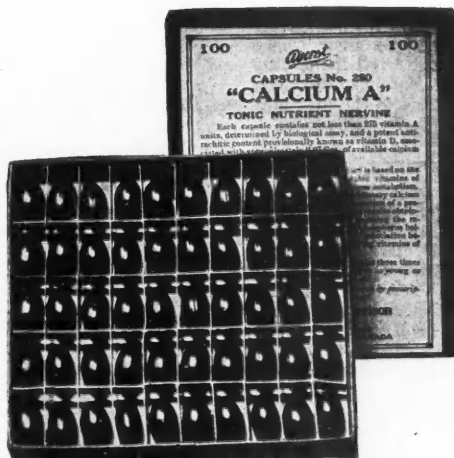
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"It is, in fact, difficult to avoid the conclusion that an important, and probably the chief, function of Vitamin A from a practical standpoint is as an anti-infective agent, and that a large number of common infective conditions are due to the deficiency of this substance in the diet of many people."

See page 691, B.M.A.J., Oct. 20, 1928.

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stitutes for those whose charters were revoked, these being the

American Medical University, Kansas City, and the Missouri College of Medicine and Science, St. Louis.

From such information as has been obtained regarding these institutions, they cannot be given a rating higher than class C, and, therefore, are deemed unworthy of recognition as medical schools.

The American Medical Association Morning Health Talks and Evening Health Hints from Hygeia

The American Medical Association broadcasts these daily at 10 o'clock in the morning and 8 o'clock in the evening, central standard time, over Station WBBM (770 kilocycles, or 389.4 metres).

University of Pennsylvania

The university is conducting a fifteen year campaign for about \$45,000,000, for additions, improvements, and endowment.

Gifts of \$250,000 each from the Rockefeller Foundation and the General Education Board have been received for a laboratory of anatomy and physiological chemistry, with the proviso that the university raise a similar amount, which has been done. This building has already been completed. Another building is under construction, the Martin Maloney Memorial Clinic of the university hospital. This is the first unit in the modernization and expansion of the hospital.

Johns Hopkins University

On December 5, 1928, the new dispensary and outpatient department of the Medical School was dedicated. Addresses were given by Frank J. Goodnow, LL.D., President of the University; Henry S. Pritchett, Ph.D., of the Carnegie Corporation; Warfield T. Longcope, M.D., Professor of Medicine; W. H. Smith, M.D., Director of the Hospital; and W. H. Welch, M.D., LL.D., Professor of the History of Medicine. The building is the result of a gift of \$2,000,000 from the Carnegie Corporation, and cost \$1,100,000,

the balance of the donation being set aside for endowment. The building is a memorial to the friendship between Andrew Carnegie and Daniel C. Gilman, the first President of Johns Hopkins University.

The American College of Physicians

The thirteenth Annual Clinical Session of the American College of Physicians will be held at Boston, Mass., from April 8th to 12th; at the Hotel Statler. The Secretary-General is Dr. George M. Piersol, Philadelphia.

The Spring Assemblies of the Inter-State Post-Graduate Medical Association of North America

We are asked to direct attention to the Spring Assemblies of the above-named Medical Association of North America, which are to be held from April 15th to May 9th, of this year. The itinerary calls for clinics first of all in Rochester, Minn., followed by meetings in the following cities, Chicago, Cleveland, Boston, New Haven, New York, Philadelphia, Baltimore, and Washington. The party may be joined at any point en route. For further details of this comprehensive set of clinics, application should be made to Dr. Wm. B. Peck, Managing-Director, Freeport, Ill., or S. Vern. Leonard, 823 Empire Bldg., Milwaukee, Wis.

The Society of American Bacteriologists

Dr. Ludvig Hektoen, of Chicago, was elected President of the Society of American Bacteriologists at the recent annual meeting held at Richmond, Va.; Dr. Stanhope Bayne-Jones, Vice-president; and Dr. J. M. Sherman, of Ithaca, Secretary.

A testimonial dinner was given recently in Baltimore in honour of Dr. W. H. Welch, Professor of the History of Medicine in Johns Hopkins University, and Director Emeritus of the School of Hygiene and Public Health.

Dr. Harvey Cushing, Professor of Surgery in Harvard University, has received the Peruvian decoration of the Order of the Sun.

GENERAL

Children and Moving Pictures

The Child Welfare Committee of the League of Nations is studying the effects of moving pictures on children. It recommends that the attention of every country be drawn to the advisability, from the point of view of the moral and physical welfare of the young, of showing films in diffused light or in daylight.

An English Hospital in Paris

It is not generally known that there is in Paris a hospital, established in 1876, for the benefit of the English residents of the French capital. When it was founded there were only some 10,000 English people in the whole of France; now there are 90,000. The institution referred to, called the Hertford Hospital, is making plans for its enlargement and improvement.

The International Surgical Society

The eighth congress of the International Surgical Society will be held in Warsaw, Poland, from July 23 to 26, under the chairmanship of Professor Hartmann. The General Secretary is Dr. Leopold Meyer, 72 rue de la Loi, Brussels, Belgium.

The Nobel Prize for Chemistry

Professor Adolf Windaus, of Gottingen, the discoverer of ergosterin, has been awarded the Nobel Prize for chemistry for 1928.

The First International Hospital Congress

The first International Hospital Congress will be held at Atlantic City, from June 12th to 19th, and will be attended by physicians, nurses, superintendents, architects, and engineers. The membership fee is \$5.00. All information can be obtained from Dr. René Sand, 2 Avenue Velasquez, Paris.

Sir Squire Sprigge, editor of the London *Lancet* has been visiting medical schools in Canada and the United States. His report on the state of medical education on this side of the water should be read with interest.

M. Pierre Masson, manager of the largest publishing house in Paris, died recently from influenza, at the age of sixty-four. He was the publisher of *La Presse Médicale*, one of the most important of the French medical journals.

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for Secondary Anaemia

ADEQUATE DOSAGE—6 to 10 capsules per day—stimulates blood forming tissue and supplies iron for hæmoglobin. A few cell counts and hæmoglobin determinations will present convincing evidence.

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Blaud, Arsenic and Strychnine

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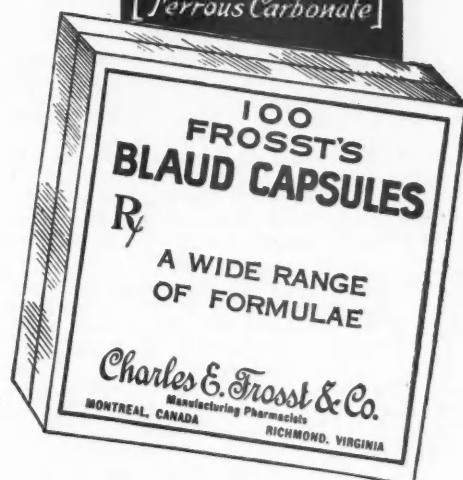
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Book Reviews

No. 3 Canadian General Hospital (McGill 1914-1919). Edited and compiled by R. C. Featherstonhaugh, with a Foreword by H.R.H. The Duke of Connaught. The Gazette Printing Co., Montreal, \$5.00 cloth; \$10.00 edition de luxe.

The story of a war hospital is well told in this book of 274 pages. Events are related in chronological order, and although many features of medical and surgical interest are described, they are not of too technical a character for lay readers.

The inception of the hospital was due to Colonel (now General) Birkett, who gathered a staff of unusually well qualified officers, almost exclusively from the teachers and graduates of McGill University. The personnel was largely recruited from medical students, who by their devotion and intelligence did much to ensure the success of the unit. The nursing sisters were also drawn from graduates of the Montreal hospitals, and their devotion to duty, often under the most trying circumstances, is worthy of the highest praise.

The first patient admitted states that the O.C. took his hand, others his pulse and temperature, "and some blighter his watch," the loss being evidently compensated for by his cordial welcome!

Whilst a large portion of the book is devoted to details of the personnel, and is of interest chiefly to them, one is struck by the cheerfulness and good humour pervading all ranks in the middle of such discomforts as mud to the knees and leaky and collapsing tents, experienced in their first location at Dannes-Camier. More comfortable accommodation was later found at the partly destroyed Jesuit College at Boulogne, where the chief work of the unit was carried on. Although the Boulogne area was frequently bombed, No. 3 was fortunate in escaping the serious casualties suffered by certain other hospitals. It was here, however, that the unit suffered the loss of three highly esteemed officers and two nursing sisters, who succumbed to fatal illness.

A record of over 143,000 patients, with a death rate of 1 in 135, sums up the achievement of No. 3 Hospital, in the period from August 7, 1915, to May 12, 1919.

The book is well printed on good paper and illustrated by a number of photographs, and reflects great credit on the publishers. F. G. FINLEY

Problems in Surgery. University of Washington, Graduate Medical Lectures 1927. George W. Crile, M.D. 171 pages, 49 illustrations. Price \$4.50. Philadelphia and London, W. B. Saunders & Co.; Toronto, McAllister & Co., 1928.

The problems discussed in this volume are such as the busy surgeon meets with almost daily—the acute infections, shock, pre-malignant and malignant conditions, operations on bad-risk cases, hyperthyroidism, etc.

In the acute infections "since chemical and vaccine therapy have failed" the adoption of the physiological method is advocated. What to do and what not to do are stated, in places with the explicitness of the experienced teacher. "Cut and quit, do not explore" is an injunction frequently given and no doubt still needed, especially in acute abdominal infection.

In the chapter on malignant disease a judicial weighing of the comparative values of radical excision and radiation, in the treatment of malignancy in the various organs, is given. Radiation is the method of choice in certain skin cancers, in cancers of the uterine cervix, and in rectal growths low enough to permit the implantation of radium needles through the anus. Radiation of the metastases in lymph nodes is regarded as useless.

"Operations on the bad-risk patient" is the subject

of the third chapter. The author, probably more than any other man, has taught the profession the best methods of meeting this problem. These teachings are here reinforced in a convincing manner by data derived from animal experiments. Particular emphasis is placed upon the importance of protecting the liver from trauma, cooling, and the damage resulting from ether anesthesia; and, also, upon the importance of heat by diathermy, in stimulating the liver in all its functions, especially in the "neutralization of the acid by-products of the infection process."

Hyperthyroidism, according to the hypothesis advanced, is simply an over-production of both thyroxin and adrenalin, resulting in a ruinous activity of all the metabolic processes of the organism.

The final chapter of thirty pages is devoted to a discussion of "A bipolar interpretation of certain normal and pathological conditions." Although the author has presented the hypothesis that the animal organism is a bi-polar electric mechanism in several papers during the past six years and in book form in 1926, the biochemists and the physiologists, to whose department this work belongs, have remained strangely silent. They are the men best qualified to test the accuracy of the experimental work upon which the hypothesis is based. Clinicians will eagerly welcome any new light they may throw upon this alluring conception.

Dr. Crile's reputation warrants careful consideration of anything coming from his pen. JAMES MCKENTY

Diseases of the Ear, Nose and Throat. Medical and Surgical. Wendell Christopher Phillips, M.D. Seventh edition. 922 pages, 615 illustrations. Price \$10.00 net. F. A. Davis Co., Philadelphia, 1928.

Dr. Phillips' work has won a place as one of the standard text-books on diseases of the ear, nose and throat, and the seventh edition lives up to the reputation of its predecessors. It is of special interest to any one who wishes to ascertain the New York view-point on this subject, or, more particularly, that of the Manhattan Eye, Ear and Throat Hospital. The work of the staff of that great institution figures very largely in its pages.

In the preface the author states that many methods and procedures which are becoming obsolete have been eliminated, nevertheless, as in so many text-books which have gone through several editions, there are still some old friends in this category with which the author seems loath to part. A great many of the illustrations of instruments could be dispensed with, without impairing the utility of the book; quite a few are no longer in general use.

Modern methods of examination, particularly the hearing tests with the audiometer, are well described, and there is a new and instructive chapter on the "Medico-social problems resulting from hearing impairment."

C. W. GRAHAM

Acute Infectious Diseases. Jay Frank Schamberg, A.B., M.D., and John A. Kolmer, M.Sc., M.D., LL.D. Second edition, thoroughly revised. 888 pages, 161 engravings. Price \$10.00 net. Lea & Febiger, Philadelphia, 1928.

A volume of 892 pages on this field of medicine is forbidding, yet there are few pages which could be omitted if the authors were to attain their objective. The authors recognizing the difficulties of the profession in overcoming the carelessness of the public and in counteracting the mischievous activities of "antis" have enlarged the present edition by introducing the important data as to the efficacy of vaccination and the production of immunity by other means. The dangers avoidable and unavoidable connected with these are fully discussed.

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Fresh Livers—Livers used in Mead's Standardized Cod Liver Oil are strictly fresh.

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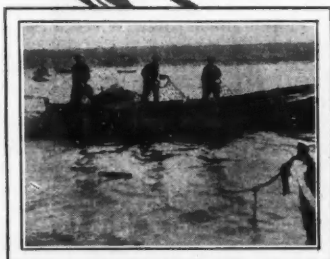
Biological Test—This control number is used in the laboratories of Mead Johnson and Company to determine the vitamin D potency of every trap-load of fish and every batch of oil. It is tested upon rats, the most satisfactory animals for this purpose.

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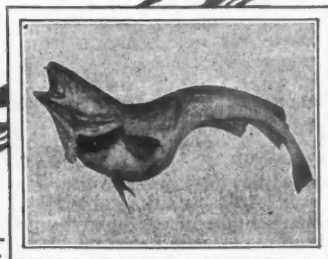
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*Left:
Hauling
Traps*



*Right:
Cod with en-
larged liver*

The question of transmission and the control of carriers is taken up in each section and in an additional chapter. The tests for determining susceptibility and immunity are given in detail.

In doing this the clinical details have not been neglected and they have succeeded in giving an excellent conception of infectious disease. The illustrations are very effective. In the clinical section the peculiar difficulties of the physician dealing with infectious disease in institutions for children might have been emphasized, such as the spread of scarlet fever from infants during epidemic otitis media, the frequent absence of local signs and rapidly fatal course of diphtheria arising in the course of measles, etc. So few errors are to be found that it is unfortunate that such a technical error as figure 116, page 519, so readily catches the eye of the casual observer as to suggest to him a carelessness which does not exist in this most excellent book. W. GOLDIE

Erythema Nodosum. J. Odery Symes, M.D., Consulting Physician to the Bristol General Hospital. 70 pages, illustrated. Price 5/- net. John Wright & Sons, Bristol, 1928.

Dr. Symes' book "Erythema Nodosum" is based largely on personal observations and records of 250 cases of the disease, extending over a period of some thirty years. He believes that erythema nodosum is a distinct clinical entity; that it is a constitutional disease presenting cutaneous manifestations; and that it is closely associated with tuberculosis. The book deals with a discussion of its etiology, pathology, clinical features, and, lastly, its possible relation to other diseases.

Erythema, in his experience, is three times as common in females as males. It may occur in mild epidemic form. At times contact infection is suggested.

Pathological and bacteriological studies of the erythema nodules has been made. These lesions are essentially an arteriolitis with a surrounding inflammatory zone. They always heal without suppuration, by means of organization of the vessel and by scar formation. Bacteria have never been found in them, nor do acid-fast stains or guinea-pig inoculations show the tubercle bacillus.

The disease begins after a variable incubation period, with fever, often tonsillitis, and commonly pains in the joints which may be taken for acute rheumatic fever. In about ten days the nodules appear.

Dr. Symes believes that the disease bears no relation to erythema multiforme or to rheumatic fever. He outlines very convincingly the numerous points in support of this contention. Lastly, he shows that although there is strong clinical evidence that erythema nodosum is associated with tuberculosis, yet proof of such an etiology is lacking. The great majority of cases of erythema nodosum are alive and well years after the attack. Nevertheless, the reader is left with the impression that there is some obscure association between the two diseases. As Symes points out, erythema nodosum may prepare the soil for the tubercle bacillus, or, if centres of latent disease exist in the individual, light them up to renewed and often fatal activity. Only two cases of erythema nodosum died under his personal observation, both of tuberculous meningitis.

Dr. Symes has presented a comprehensive picture of the disease, as he has seen it over a period of three decades. E. S. MILLS

The Dermatogoses or Occupational Affections of the Skin. R. Prosser White, M.D., M.B., C.M. Ed., M.R.C.S. Lon. Third edition. 734 pages, illustrated. Price 35/- net. H. K. Lewis & Co., London, 1928.

The third edition of Prosser White is bigger and better than ever. It is now time to refer to it as an encyclopædia rather than a text-book. One only has to read it to realize what an important rôle occupation plays in the development of skin diseases, and what a

tremendously complicated science industrial chemistry has become.

It will be noted that a new term has been given to denote occupational affections of the skin. We believe this name is adequate, but it is difficult to pronounce and undeniably ugly, though in this respect it matches many of the conditions it has been created to name. For those who are unacquainted with the earlier editions of this work, it may be said that it is designed to act as a reference book for physicians, and even laymen, who desire information concerning the effects of occupation on the skin. One cannot recommend it as light reading, for it is crammed with facts, references and foot notes, and in addition it is sprinkled with italics and bold-faced type which interrupt the continuity of the text and make continued reading very tedious; it is essentially a reference book. There is, in fact, no other book on occupational dermatoses in the English language to compare with this.

One hesitates to criticize anything in a treatise that shows such a detailed knowledge of occupations and of dermatology, but certain omissions which are rather apparent to American readers are here noted. In the chapter on burns no reference is made to the tannic acid treatment which is becoming popular in this country; in the chapter on light the Angstrom unit, as a measure of wave length, is not mentioned. A rather detailed discussion of the effects of paraffin oils on the skin is given, but practically nothing is said of the theory which attributes cutting oil acne to actual contamination of the oil with pyrogenic organisms, and in the discussion of mule-spinners' cancer, the claim of Robertson that it is due to friction from dyed overalls, and not to paraffin oil, is only mentioned in a foot note.

The author's remarks on the subject of sensitization to inorganic chemical irritants will be approved by the rank and file of physicians, but may be disputed by certain dermatologists. We quote from the text:—

"If it (the eruption) be continuous, or repeat itself when the offending agent is completely withdrawn, it points to the fact that the chemical is not the predominating, or causal, factor in its repetition or continuance, except in certain agents which cause epithelioma (remote effects). At any rate, in cases which extend over months or years, the onus of proof should be borne justly by the plaintiff. It cannot logically be credited to the original agent."

This edition shows evidence of very complete revision, in fact, most of the book appears to have been rewritten. It is gratifying to the industrial hygienist to find more information concerning treatment and prevention. The text has been enlarged, and a very complete index of 204 pages has been provided. A glossary of technical words has been supplied, ostensibly for the lay-reader, but we believe that the medical reader may have occasion to consult it. The printing is good; there are very few typographical errors; and the plates are, for the most part, excellent.

FRANK G. PEDLEY

Neurological Examination. Charles A. McKendree, A.B., M.D., with Foreword by Henry Alsop Riley, A.M., M.D. 280 pages, illustrated. Price \$3.25. London and Philadelphia, W. B. Saunders Co. Canadian Agents, McAlush & Co., 1928.

This volume is an elaborated description of the methods of examination in use in the Department of Neurology, College of Physicians and Surgeons, Columbia University. It gives a very minute account of the procedures adopted in approaching a neurological case and an interpretation of findings. The detail, which is crowded into such a limited space, is somewhat sacrificial of specificity and is, therefore, in places, rather confusing, since little distinction is made between important and unimportant signs. The wealth of information contained in the book makes it a much more suitable work

Note for the Medical Profession

Sepsis

UNTIL recently, no antiseptic has been available for the treatment of sepsis which not only possesses adequate germicidal power, but can be applied in effective dilutions without damage to tissues.

Monsol has a germicidal action on the *Streptococcus Pyogenes* more than ten times greater than that of pure phenol or lysol, and can be applied in dilutions stronger than those found capable of killing this organism, even to mucous membranes.

The following are some of the conditions in which this property can be utilised:

Throat Infections

As a gargle in streptococcal tonsillitis; for the treatment of streptococcus carriers in scarlet fever outbreaks.

Skin Conditions

As an ointment or lotion in impetigo and other forms of dermatitis; for boils and carbuncles.

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As an immediate prophylactic application, or as a dressing for injuries already septic.

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As a vaginal or intra-uterine douche.

Dental Sepsis

As a mouth-wash after extractions.

Many hundreds of letters have been received from medical men testifying to the value of Monsol in the treatment of septic conditions.

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for prospective neurologists than for undergraduate students, but one which everyone whose work is chiefly neurological should keep within reach. The procedure of the examination is arranged as doubtless the author has found most advantageous, but one feels that the investigation of the intellectual faculties should start rather than end the examination. That, however, is a very minor consideration in any investigation, provided that a definite system is adopted, as the book advises, and written records made. The paper, printing and composition are excellent, while a very complete index adds materially to the value of the book as a work of reference.

F. BRODIE

Ultra-Violet Radiation and Actinotherapy. Eleanor H. Russell, M.D., B.S., and W. Kerr Russell, M.D., B.S. 648 pages, illustrated. Third edition. Macmillan Company, Toronto, 1928.

Some indication of the rapidly growing interest in this subject may be gained from the fact that the third edition of this work has just been issued. This volume is greatly enlarged and improved, and is now one of the most complete expositions of the subject to be found in English. The authors deserve credit for the pains they have taken in describing the differences in apparatus, the usefulness of each and usually the scientific value and practical effectiveness. The reader can thus usually find an answer to many of the questions he has in mind and on which he finds a difficulty in getting accurate information.

The whole question of the use of the carbon arc is fully discussed. In England and on the Continent the carbon arc is widely used in a great variety of modifications. In therapy it has several advantages, but has also certain handicaps. This is all fully covered with specific details of the use of various metallic "cores." Other types of lamps, including tungsten, iron and of course quartz-mercury vapour, are equally fully described and the relative merits of each are explained. In this respect the volume is a complete encyclopædia of information with, naturally, since the book is an English production, the emphasis on English and Continental apparatus.

The section on biological effects is admirable and from a careful reading of this chapter one gains an understanding of the therapeutic possibilities and limitations. Without such an understanding of biological effects, the attempt to make use of ultra-violet radiation is blind empiricism. Following is a new chapter on the possible dangers or harm which may result from overdosage, or excessively prolonged use of otherwise perfectly proper doses. There are also listed certain contraindications to the use of ultra-violet radiation.

With the groundwork thus thoroughly prepared, the remainder of the volume is devoted to the technique of application, and the actual use of this agent in therapy, in general medicine, in dentistry, and in veterinary practice. The statements made are, almost without exceptions, conservative in character and may be accepted without reservation. There is no longer any doubt of the great value of ultra-violet radiation as a substitute for sunshine during the months from October to May, and also in a more specific way in therapy, but most of the literature on the subject heretofore has been propaganda. This volume may be regarded as a scientific treatise on a par with other standard medical works, and should be welcomed cordially by anyone who wishes to inform himself on this subject.

G. E. RICHARDS

The Sack'Em-Up Men. James Moore Ball, M.D., LL.D. 216 pages, illustrated. Price 16/-. Oliver & Boyd, Edinburgh, 1928.

This work, which gives an account of the rise and fall of the modern resurrectionists, has appeared, with somewhat grim appropriateness, just one hundred years

since the activities of the arch-types Burke and Hare, for Burke was brought in guilty of murder on Christmas Day, 1828, and hanged on January 29, 1829. The events incident to the case were the cause of wild excitement at the time, and they are not forgotten even yet. The story is told with considerable detail in this book, with others not unlike.

The greswome title—*The Sack'Em-Up Men*—leads us to expect a tale to harrow up the soul, and, indeed, we are not altogether disappointed. But, while the proceedings of the grave-robbers of a century ago are dealt with from many aspects, it was clearly far from the intention of the author to produce a mere "thriller," and his book is much better than this. His object was to record the activities of a few of the "resurrectionists" whose lives were spent in securing material for the teaching of anatomy, to explain the conditions which made body-snatching a necessity, and to preface the whole story with a short account of the history of anatomy.

The first forty-five pages deal with the last-mentioned topic, from the old Egyptian days until the time of Vesalius and Charles Etienne. Nine chapters deal with the resurrection man, both lay and medical; two chapters are devoted to the resurrectionist as a subject in literature; one chapter gives the original English Anatomy Act, and records the steps leading up to its final passage; and the book concludes with an account of early anatomical instruction in the United States.

The result is an eminently readable book. The plates, on special paper, are particularly good, and the text-figures are alluring. The beautiful second and ninth plates of the muscles, taken from the *De Fabrica*, compared with the anatomical figures of Ricardus Hela and Laurentius Phrysen, help to slow the immense gap that exists between Vesalius and the anatomists who flourished fifty years or less before him. The style, with the exception of an occasional tendency to affectation which may be excused, is pleasing, and the book, as a piece of craftsmanship, is excellently good. The author has well succeeded in his task, and has produced a valuable record of the historical aspect of anatomy.

A. G. NICHOLLS

Anatomical Studies on the Motion of the Heart and Blood. William Harvey, M.D. Translated by Chauncey D. Leake. 226 pages, illustrated. Price \$3.50. Charles C. Thomas Co., Springfield, Ill., 1928.

No effort should be overlooked which aims at making Harvey's work familiar to medical men. He would be something of a curiosity who knew nothing at all of Harvey, but do those who know about him know as much as they should? How many have actually seen a copy of the "*De Motu*," or, if they have, can say that they have read it through? These interesting questions are never likely to be answered but Dr. Leake has done something to render them at least less unlikely to arise.

His edition of the immortal "*De Motu*" is the first English translation to be published in America, and only the fourth (he says third, but evidently does not include Dr. Michael Ryan's edition of 1832) in the last 300 years. Dr. Leake's feeling is that Harvey's writings would be more widely read if they were rendered into English of the day, and his translation therefore is considerably more colloquial in nature than that of Robert Willis which is that most commonly seen. But this is no disadvantage for Willis's translation was not only undistinguished in style, but also contained certain inaccuracies.

Dr. Leake's venture deserves great commendation. The general appearance and make-up of the book are fine, and should increase the number of readers of Harvey very considerably. It is to be noted, however, that there are a number of misprints and incorrect

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spellings of names which might have been avoided by more careful proof reading.

H. E. MACDERMOT

Laboratory Diagnosis and Experimental Methods in Tuberculosis. Henry Stuart Willis, The Johns Hopkins University and Hospital. With a chapter on **Tuberculo-Complement Fixation.** J. Stanley Woolley, Loomis Sanatorium N.Y. 8vo. Pp. xv+318. Price \$3.50. Charles C. Thomas, Springfield, Ill., 1928.

The author explains in his preface that he aims to describe the more important methods of laboratory diagnosis in tuberculosis and to consider some of the more significant procedures and principles involved in experimental study of tuberculous infection. The first chapter treats of the excretions, secretions and fluids of the body studied in connection with tuberculosis—sputum, urine, stools, serous effusions, pus and the blood. Then follows a chapter on staining methods in relation to these various fluids, concentration methods and animal inoculation methods. The bacillus itself and its types form another chapter, followed by a discussion of media and methods of cultivation. Other acid-fast bacteria are considered. The various tuberculin are described with their use in diagnosis. The chapters by J. Stanley Woolley on Serology and Complement Fixation give the writer's impression of the value of the various methods. The last part of the book deals with methods used in experimental tuberculosis both in infection and in pathological study. There is a useful bibliography covering sources and guiding the reader who may wish to pursue further some particular line of investigation.

As thus arranged, it is not only for the laboratory worker and public health official, but offers the practicing physician a presentation of practical methods available for him to use in diagnosis, while for the medical student it gives in form of a manual a comprehensive survey of methods of diagnosis and experimental study.

The work is admirable from the fact that the author has sifted the enormous literature of studies on tubercle infections, and presents that which is important and practical with his own comment and valuation of the procedures described. We quite agree with Allen K. Krause in his Introduction that Dr. Willis has performed a long needed service in presenting in orderly manner the principles and procedures of experimental methods in tuberculosis. This has been done in such a manner that the laboratory diagnosis of the ordinary case of tuberculosis can be accomplished by the physician in his office by simple methods.

J. H. ELLIOTT

Elements of the Science of Nutrition. Graham Lusk, Ph.D., Sc.D., LL.D., F.R.S. Fourth edition, revised. 844 pages, illustrated. Price \$7.00. London and Philadelphia, W. B. Saunders Co. Canadian Agents, McAinsh & Co., Toronto, 1928.

Undoubtedly the medical profession will receive this new and enlarged edition of Professor Lusk's book with satisfaction for it is our most important English publication upon the fundamentals of nutrition. In accordance with progress the volume has been appreciably enlarged, embodying several new chapters and much more extensive reference to contemporary research.

The hope expressed by the author in the previous edition, seven years ago, that the progress of scientific knowledge would permit of the development of the subject from the standpoint of physical chemistry has not been fulfilled. Therefore the mode of presentation is little changed.

Among new material presented and old matter extended we find a more extensive treatment of "The

Regulation of the Temperature and Basal Metabolism," "Oxidation and Reduction," a thorough presentation of the more recent ideas upon the intermediary metabolism of carbohydrate, and an enlarged treatment of the vitamins.

The discussion of the various diseased states, especially diabetes mellitus and alterations in function of the ductless glands, which have a fundamental relationship to nutrition, includes much of recent publication. Professor Lusk deals rather sharply with the hypothesis that fat is transformed into glucose in the diabetic, terming it after a full discussion "a figment of the imagination." In the field of the ductless glands their treatment is simple and sane, a demonstration of the spirit of scientific accuracy which prevades the whole book.

It would seem to the reviewer that this volume should be of great value to the medical student in linking his fundamental studies, physiology and biochemistry, to a study of disease in the sick patient. To the student of exact medicine it stands as one of his main reference volumes.

E. H. MASON

The Injection Treatment of Varicose Veins. A. H. Douthwaite, M.D., M.R.C.P. Third edition, 51 pages. Price 4/- net. H. K. Lewis & Co., London, 1928.

The third edition of this useful booklet follows the same arrangement as the previous editions and contains practically the same subject matter. After a brief historical résumé of the subject detailed instructions are given for the use of the salts of quinine in the production of obliterative thrombosis in varicose veins. The method of preparing the solutions is described, together with the immediate and late effects of the injection, the complications, the contra-indications, and the problem of varicose ulcers.

Although the author emphatically recommends the quinine salts the book includes a brief account of alternative solutions which may be used.

R. R. FITZGERALD

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